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# **Hazardous and Solid Waste Amendments of 1984 Permit Modification Request No Further Action Proposals**

**Los Alamos**  
NATIONAL LABORATORY

Los Alamos, NM 87545

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## EXECUTIVE SUMMARY

The Los Alamos National Laboratory (the Laboratory) is requesting from the New Mexico Environment Department (NMED) Hazardous and Radioactive Materials Bureau a Class III permit modification for removal of nine solid waste management units (SWMUs) from Module VIII of the Laboratory's Hazardous Waste Facility Permit.

SWMUs are proposed for removal from Module VIII based on one of five no further action (NFA) criteria. In this request for permit modification, the following two SWMUs are being proposed for removal from Module VIII of the Laboratory's Hazardous Waste Facility Permit under NFA Criterion 1:

SWMU 02-008(b), an inactive outfall (nonexistent)

SWMU 15-012(a), an operational release (reputed)

The following two SWMUs are proposed for removal from Module VIII under NFA Criterion 3:

SWMU 06-003(g), an inactive firing pad and the footprint of a former building that was used for processing high explosives

SWMU 15-009(j), a former septic tank and associated seepage pits

The following two SWMUs are proposed for removal from Module VIII under NFA Criterion 4:

SWMU 00-033(a), a former underground storage tank

SWMU 40-003(a), a former detonation site

The following three SWMUs are proposed for removal from Module VIII under NFA Criterion 5:

SWMU 00-016, a former small-arms firing range

SWMU 15-012(b), a former wash area for explosive devices

SWMU 21-005, a former nitric acid pit

The NMED Hazardous and Radioactive Materials Bureau has concurred with the NFA proposals for eight of the nine SWMUs via approval of a Resource Conservation and Recovery Act (RCRA) facility investigation report, a voluntary corrective action completion report, or the implementation of a RCRA closure in accordance with an approved closure plan. The remaining SWMU [00-033(a)] has received an approved closure letter from the NMED Underground Storage Tank Bureau.



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## 1.0 INTRODUCTION

The Los Alamos National Laboratory (the Laboratory) is requesting from the New Mexico Environment Department (NMED) Hazardous and Radioactive Materials Bureau (HRMB) a Class III permit modification for the removal of nine solid waste management units (SWMUs) from Module VIII of the Laboratory's Hazardous Waste Facility Permit. The proposals for the removal of these nine units are based on field investigations, archival investigations, and/or site cleanups performed by the Laboratory's Environmental Restoration (ER) Project.

Each SWMU proposed in this request for permit modification has been evaluated for potential risks to human health and the ecosystem. Additionally, an assessment has been made of applicable regulations and standards that may be appropriate to each site. Applicable regulations and standards investigated include surface water standards, groundwater standards, air emissions requirements, polychlorinated biphenyl (PCB) management requirements, and underground storage tank (UST) regulations (when applicable). The Laboratory ER Project has determined that each of the no further action (NFA) proposals for permit modification presented in this request is valid based on human health and ecological evaluations, as well as all other applicable regulations and standards. Documentation supporting each proposed modification is attached.

The ER Project has proposed eight of the nine SWMUs for NFA via a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) report, a voluntary corrective action completion report, or the implementation of a RCRA closure in accordance with an approved closure plan. The NMED-HRMB has approved each of the reports and the RCRA closure, thereby concurring with the proposals for NFA. The eight SWMUs are 00-016, 02-008(b), 06-003(g), 15-009(j), 15-012(a), 15-012(b), 21-005, and 40-003(a).

Based on an approved closure letter from the NMED UST Bureau, the remaining SWMU [00-033(a)] is being proposed both for NFA and removal from Module VIII of the Laboratory's Hazardous Waste Facility Permit via this request for permit modification.

### 1.1 NFA Criteria

Within the Laboratory ER Project, there are five criteria for proposing NFA for SWMUs. The NMED-HRMB and the Laboratory have agreed upon these criteria for determining NFA. The five NFA criteria are listed below.

NFA Criterion 1. The site does not exist; is a duplicate of another site; cannot be located, or is located within another site, and has been or will be, investigated as part of that site.

NFA Criterion 2. The site was never used for the management (that is, generation, treatment, storage or disposal) of RCRA solid or hazardous wastes and/or constituents.

NFA Criterion 3. The site is not known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment. The term "release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment.

NFA Criterion 4. The site is regulated under another state and/or federal authority. If the site is known or suspected of releasing RCRA solid or hazardous wastes and/or constituents to the environment, it has been or will be investigated and/or remediated in accordance with the applicable state/and or federal regulations.

NFA Criterion 5. The site was characterized or remediated in accordance with applicable state/and or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

An administrative NFA proposal based on Criteria 1 through 3 is supported by acceptable knowledge of process and/or documented information that indicates that there has not been a release at the site, thus precluding the need for characterization and/or remediation.

An NFA proposal based on Criterion 4 is supported by acceptable knowledge of process and/or documented information that confirms that if there was a release, the site was adequately characterized and/or remediated in accordance with a regulatory authority other than that which oversees RCRA corrective action. NFA Criterion 4 is based on the fact that cleanup levels prescribed under other regulatory authorities, such as the EPA Toxic Substances Control Act (TSCA) or NMED UST regulations, were developed to incorporate human health and ecological risk considerations. Therefore, SWMUs managed in accordance with other regulatory programs normally do not require subsequent action under RCRA corrective action. However, any of the above five criteria may be supported with confirmatory sampling when necessary.

An NFA proposal based on Criterion 5 is supported by data and acceptable knowledge of process and/or documented information that confirms that the site was adequately characterized and/or remediated in accordance with the Hazardous and Solid Waste Amendments of 1984 (HSWA) corrective action process.

None of the SWMUs presented in this request for permit modification have been proposed under Criterion 2.

## **1.2 Applicability of the Evaluation of Human Health Risk, Ecological Risk, and Other Applicable Regulations and Standards to NFA Criteria 1 Through 4**

NFA proposals based on administrative NFA Criteria 1 through 3 require adequate supporting documentation to establish justification for NFA. However, Criteria 1, 2, and 3 NFA proposals generally do not require environmental sampling and analyses, evaluations for risks to human health or the ecosystem, or an evaluation of the applicability of other regulations and standards.

An NFA proposal based on Criterion 4 (the site was remediated in accordance with another state and/or federal authority) indicates that these SWMUs are/were characterized and managed in accordance with the requirements specified in other applicable regulations and/or standards. Other applicable regulations and standards include surface water standards, groundwater standards, air emission standards, UST regulations, and PCB regulations. Human health and ecological health risk evaluations are inherent in (or addressed by) the cleanup levels established by other regulatory authorities, such as TSCA requirements or NMED UST Bureau regulations. Such requirements or regulations specify the human health and ecologically based cleanup levels that must be met (in the event of a release) to achieve NFA. Criterion 4 SWMUs with a confirmed release require documentation confirming that the release was cleaned to the requirements and/or standards of the applicable regulatory authority.

## **1.3 Variation from the Outline for HSWA Permit Modification Request Provided in Section II.B.4.a(4)(a) of the March 3, 1998, HRMB Document, RCRA Permits Management Program Document Requirement Guide**

As discussed in Section 1.2, environmental sampling and analyses and site assessments (human health, ecological, and other) do not apply to SWMUs being proposed for NFA under Criteria 1 through 4.

Therefore, on May 4, 1999, the ER Project negotiated an agreement with the NMED-HRMB to vary from the outline for a HSWA Permit Modification Request provided in Section II.B.4a(4)(a) of the March 1998 HRMB document, RCRA Permits Management Program Document Requirement Guide (NMED 1998, 57897). Documentation of the negotiation and the revised outline for Criteria 1 through 4 SWMUs being requested for release from Module VIII of the Laboratory's Hazardous Waste Facility Permit are included as Appendix E of this document.

#### **1.4 Organization of this Request**

Text for each SWMU in this permit modification request is separated by an indexed tab labeled with its SWMU number. Section X.1 is a brief summary of the SWMU. Section X.2 contains a description of the SWMU (including site maps, if applicable) and its operational history. The text for each SWMU is based on an RFI report, voluntary corrective action (VCA) completion report, or RCRA closure report, as applicable to that SWMU. The current and future land use of each SWMU is contained in Section X.3. Section X.4 (X.7 for Criterion 5 SWMUs) summarizes the justification for the NFA decision and states the specific NFA criterion under which each SWMU is being proposed for permit modification. The supporting documentation for each SWMU is listed in Section X.5 (X.8 for Criterion 5 SWMUs) and attached at the end of each SWMU write-up. (In order to avoid unnecessary duplication, attachments that are common to more than one SWMU are included in Appendix D.) For some attachments, the information applicable to support NFA has been highlighted to point the reader to the exact location that was referenced in the SWMU discussion. When only a small portion of a document is applicable, only the relevant pages have been included. Complete attachments are available upon request.

Section X.6 (X.9 for Criterion 5 SWMUs) provides the reference on which the text of the request for permit modification for a particular SWMU is based. Lastly, Section X.7 (X.10 for Criterion 5 SWMUs) provides a history of the regulatory deliverables for each SWMU.

For Criterion 5 SWMUs, Section X.4 provides a description of investigation activities for each SWMU; Section X.5 provides a description of the site conceptual model; and Section X.6 provides a description of the applicable site assessments, such as human health or ecological screening assessments, conducted for the SWMU.

Appendix A includes a list of acronyms and a glossary of terms used in this request. Appendix B includes the Laboratory's requested modifications to Tables A and B of Module VIII of the Laboratory's Hazardous Waste Facility Permit (none of the SWMUs addressed in this request for permit modification affect Table C; therefore, the current version of Table C is included). The date of the permit modification request is indicated next to the number of the unit proposed for modification. Appendix C includes the Proposed Tables A and B and the current version of Table C of Module VIII. These tables represent Module VIII upon final approval of all NFA requests to date. Records pertaining to this modification request are kept on file at the ER Project's Records Processing Facility. Appendix D contains attachments common to more than one SWMU. Appendix E contains the supporting documentation for varying from the outline for HSWA Permit Modification Request provided in Section II.B.4.a(4)(a) of the March 1998 HRMB document, RCRA Permits Management Program Document Requirement Guide (NMED 1998, 57897).

#### **REFERENCE**

NMED (New Mexico Environment Department), 1998. "RPMP Document Requirement Guide," Hazardous and Radioactive Materials Bureau, RCRA Permits Management Program, Santa Fe, New Mexico. (NMED 1998, 57897)



## **2.0 SWMU 00-016 FORMER SMALL-ARMS FIRING RANGE**

### **2.1 Summary**

SWMU 00-016 is a former firing range used by Laboratory security forces for small-arms target practice. The Laboratory ER Project implemented a VCA at this SWMU. VCA activities involved characterization and remediation of the site in accordance with applicable state/federal regulations. Confirmation sampling verified that residual contamination is at concentrations that pose an acceptable level of risk under current and projected future land use. NMED approved the final VCA completion report in a letter dated September 22, 1999, and approved the Laboratory's response to two NMED comments about this SWMU in a letter dated December 1, 1999. SWMU 00-016 is being proposed for NFA under NFA Criterion 5 (the site was characterized and remediated in accordance with state and/or federal regulations).

### **2.2 Description and Operational History**

#### **2.2.1 Site Description**

SWMU 00-016 is the site of a former small-arms firing range located in Rendija Canyon. The SWMU is located on US Forest Service (USFS) property in the Santa Fe National Forest.

The site comprises approximately two acres. Prior to VCA activities, the firing site had earthen ridges (berms) arranged in a semicircle to retain bullets from target practice. The firing range consisted of a backstop berm along the northern edge of the firing range floor, a side berm along the eastern edge, a tuff slope along the western edge of the range floor, and a medial berm running north and south that separated the site into two firing areas (Figure 2.2-1). Backstop berms were approximately 8 to 12 ft high and 35 to 50 ft wide. Both firing areas consisted of several firing lanes; bullets were fired in a northwest direction.

The western target area measured approximately 215 ft in length and 105 ft in width at its front and 150 ft in width at its back. This target area was bounded on the east by the central longitudinal berm, which measured approximately 240 ft long, 30 to 40 ft wide, and 8 ft high. This target area was bounded on the west by a tuff slope approximately 230 ft long and ranging from 9 to 15 ft in height.

The eastern target area measured approximately 142 ft in length and 165 ft in width. This area was bounded on the east by a longitudinal berm approximately 160 ft long, 25 to 35 ft wide, and 5 to 8 ft high and on the west by the central longitudinal berm separating the two target areas. This target area also contained two smaller, transverse berms each approximately 120 to 130 ft long, 12 to 18 ft wide, and 2 ft high.

#### **2.2.2 Operational History**

The small-arms firing range (SWMU 00-016) was constructed in 1947 for use by the Laboratory security force. The security force continued to use the firing range for target practice until the current firing range was built in Sandia Canyon in the early 1960s. In 1976, the US Department of Energy (DOE) released the Rendija Canyon small-arms firing range and surrounding areas to the USFS. The general public unofficially used the site for recreational target practice from the time the security force vacated the site in the early 1960s until 1992.

In 1991, as part of the process for initiating a projected land transfer, the USFS conducted a study of SWMU 00-016 that included analyses of soil for lead. Soil sampling results ranged between 20 to 156,100 mg/kg lead. Contamination was attributed to the presence of lead bullets. As a result of this study, the Laboratory ER Project initiated a VCA to remediate SWMU 00-016.

**Figure 2.2-1. USDA Forest Service drawing of the original firing range**

A fence was erected around the SWMU in 1992 to control access to the site during the initial planning stage of the VCA. VCA activities were conducted from September 1993 through May 1997. Pending completion of the land exchange between the USFS and a private land developer, the USFS is allowing the developer to use the site as a storage area for construction equipment and materials.

## **2.3 Land Use**

### **2.3.1 Current**

The site where SWMU 00-016 was formerly situated is located on USFS property in the Santa Fe National Forest. The USFS and the County of Los Alamos requested that the SWMU be remediated prior to transfer of the land as part of a larger public-private land exchange. The USFS land surrounding and/or adjacent to the site where the SWMU was formerly located is currently being developed for residential housing. Prior to the 1992 installation of a fence around the site where SWMU 00-016 was formerly located, access to the site was not restricted.

### **2.3.2 Future/Proposed**

Upon removal of SWMU 00-016 from the Laboratory's Hazardous Waste Facility Permit, the USFS will transfer the land parcel on which the SWMU was formerly located to a Los Alamos land developer who plans to develop the land for residential housing.

## **2.4 Investigation Activities**

A complete and detailed discussion of all investigation activities is presented in the final VCA completion report for SWMU 00-016 (LANL 1998, 59996.30) submitted to HRMB in November 1998 and approved by NMED December 1, 1999. A summary of those activities is presented in Sections 2.4.1 through 2.4.3 of this request for permit modification.

### **2.4.1 Summary**

Based on the results of a USFS study of SWMU 00-016, the ER Project conducted a VCA of the site. Confirmation sampling determined that all soils containing elevated concentrations of lead, copper, and zinc, the chemicals of potential concern (COPCs) identified for this SWMU, had been effectively removed from the site. Human health and ecological screening assessments were conducted on data from confirmation samples collected from SWMU 00-016 after the remediation of the site. Lead was detected above its background value (BV) in some confirmation samples; however, it was eliminated as a COPC because the maximum detected concentration of lead was 85.6 mg/kg, which is well below the 400-mg/kg residential cleanup level for lead. Therefore, no human health risk assessment was conducted. No COPCs were identified in the ecological screening assessment; therefore, no ecological risk assessment was performed.

### **2.4.2 Investigation #1: USFS Study of SWMU 00-016**

In 1991, the USFS conducted a study of SWMU 00-016. Twenty-one surface soil samples were collected from the earthen berms and analyzed for total lead only. Analytical results ranged between 20 and 156,100 mg/kg lead, indicating the presence of lead contamination in the soil. Contamination was attributed to the presence of lead bullets on the surface of the berms.

As a result of this study, the Laboratory ER Project initiated a VCA to address the lead contamination in surface soils at SWMU 00-016.

#### **2.4.2.1 Nonsampling Data Collection**

This section is not applicable for the USFS study of SWMU 00-016.

#### **2.4.2.2 Sampling Data Collection**

Twenty-one surface soil samples were collected from the earthen berms. The samples were analyzed for total lead only, using EPA Method 7421 (atomic absorption spectroscopy).

#### **2.4.2.3 Data Gaps**

This section is not applicable for the USFS study of SWMU 00-016.

### **2.4.3 Investigation #2: VCA Remediation of SWMU 00-016**

VCA activities were conducted from September 1993 through May 1997. Two screening methods were used to assist in determining the extent of contamination and to screen the soil prior to the collection of samples: metal detection of lead and bullets in the soil and analysis of lead in the soil using x-ray fluorescence (XRF). Use of these methods allowed for sample location selection that targeted higher concentrations of lead.

Two methods of remediation were used during VCA activities. The first involved soil washing to remove the lead bullets and fine lead particles by density separation. The second method involved mechanical separation (using a shaker plant) to sieve the soil to remove the lead bullets and lead fragments.

Following the excavation and processing of contaminated soils, confirmation sampling was conducted on the range floor, the back area of the range, the utility right-of-way (that eventually would be used by the private land developer), and in first-order drainages around the site. Confirmation samples confirmed that all soils containing elevated concentrations of lead, copper, and zinc had been effectively removed from soils at the site.

Site restoration was conducted on the floor and in the back area of the range after completing confirmation sampling. Restoration activities included recontouring, grading, installing permanent storm water run-off and erosion controls, and revegetating denuded areas. The range floor was reseeded and mulched with straw to facilitate revegetation and prevent erosion. The area is currently well revegetated and shows no evidence of erosion. Restoration of the back area included replacing removed soils with clean top soil, reseeding the area, and covering it with biodegradable erosion-control matting. The area is currently well vegetated and no significant erosion has been observed.

Based on an EPA ruling that allowed processed soils with less than 400 mg/kg of total lead to be reused, the private land developer used approximately 6000 yd<sup>3</sup> of processed soils from SWMU 00-016 for the widening and elevation of 400 ft of Range Road prior to its paving. This fill area extends under the pavement south of Aspen Drive to the bend in the road at the first guard rail on the west side of the road. (Parker 1998, 62234) (Attachment A). The fill area lies more than 50 yd away from the nearest watercourse and is located in an area that has low erosion potential because of its topography and vegetative cover.

#### **2.4.3.1 Nonsampling Data Collection**

Two methods were used to help determine the extent of contamination, refine the soil washing process, and screen the soil prior to the collection of fixed-site-laboratory samples. The methods used were metal

detection of the lead and bullets in the soil, and analysis of lead in the soil using XRF in a mobile laboratory set up at the SWMU. These methods allowed for sample location selection that targeted higher concentrations of lead as well as rapid turnaround of sample results. Without these field screening techniques, site activities would have stopped during periods of fixed-site-laboratory analytical testing.

#### **2.4.3.2 Sampling Data Collection**

Post-VCA excavation and processing confirmatory sampling was conducted in the range floor, the back area, the right-of-way, and the first-order drainages to demonstrate that materials containing elevated concentrations of copper, lead, and zinc had been removed. A total of 54 confirmatory samples were collected and submitted to a fixed-site analytical laboratory for analysis of total recoverable copper, lead, and zinc by EPA SW-846 methods.

#### **2.4.3.3 Data Gaps**

There were no data gaps. Sufficient data were collected to adequately determine nature and extent (horizontal and vertical) of contamination.

### **2.5 Site Conceptual Model**

A complete and detailed discussion of the site conceptual model is presented in the VCA completion report for SWMU 00-016 (LANL 1998, 59996.30) submitted to HRMB in November 1998. A summary of the site conceptual model is presented in Sections 2.5 through 2.5.2 of this request for permit modification.

SWMU 00-016 was a small-arms firing range with earthen berms arranged to retain bullets. The primary release of contaminants was via the deposition of lead bullets into the range berm and floor soils during the active use of the site. A secondary release of contamination might have occurred, caused by weathering and dispersal through wind and/or waterborne erosion.

#### **2.5.1 Nature and Extent of Contamination**

The lead bullets and associated fragments were assumed to be largely restricted to the range itself, with a majority of the bullets remaining in the target and backstop berms. The primary COPC was elemental lead; however, copper and zinc, commonly present as minor components of lead bullets used with small arms, were also considered as COPCs.

Based on the physical process that created the contamination (the firing of bullets into targets), it was expected that lead concentrations would decrease with increasing distance from and depth beneath the surface. Concentrations were pursued using metal detector responses, XRF lead results, and fixed-laboratory results for lead, copper, and zinc. Horizontal and vertical extent were determined as residual concentrations decreased to less than the cleanup levels for lead, copper, and zinc, based on confirmation sample results. Residential cleanup levels were 400, 2800, and 22,000 mg/kg for lead, copper, and zinc, respectively. Soil containing lead contamination was removed until sample results were less than the established cleanup levels. This process also removed any unexploded bullets remaining in the soil. After soil processing and removal of the berms and soils from the back and floor of the firing range, confirmation samples across the range floor and in the back area of the site were all below the cleanup level; thus confirming the remediation of both horizontal and vertical extent.

## **2.5.2 Environmental Fate**

Water solubility, soils adsorption, and vaporization were considered because they are the main routes by which metals enter and are distributed in the environment. Metallic cations are insoluble in soil, especially in neutral pH soils such as those present at the firing range. Adsorption particulate matter is a major mechanism by which metals are retained in neutral pH soils and prevented from moving in solution. Vaporization of the lead, copper, and zinc was considered to be highly unlikely because of the low vapor pressures of these metals.

## **2.6 Site Assessments**

### **2.6.1 Summary**

Lead was detected above its BV in some confirmation samples for SWMU 00-016; however, it was eliminated as a COPC in the human health screening assessment because it posed no unacceptable risk to human health. Therefore, no human health risk assessment was necessary. No COPCs were identified in the ecological screening assessment; therefore, no ecological risk assessment was necessary.

### **2.6.2 Screening Assessments**

A complete and detailed discussion of the screening assessments is presented in the VCA completion report for SWMU 00-016 (LANL 1998, 59996.30) submitted to HRMB in November 1998. A summary of the screening assessments is presented in Sections 2.6.2.1 and 2.6.2.2 of this request for permit modification.

#### **2.6.2.1 Human Health**

The future land use for SWMU 00-016 is residential. Therefore the exposure assumption is that people will be living on the land 24 hours a day for 70 years. The exposure pathways identified were inhalation, ingestion, and dermal contact of contaminated soil.

The data review indicated that lead was present at a concentration greater than its BV of 22.3 mg/kg. The maximum concentration of lead in confirmation samples (85.6 mg/kg) was compared with the residential cleanup level for lead (400 mg/kg) to determine if lead was present at concentrations of potential concern. Because lead was the only COPC at the site detected at concentrations greater than BVs, no adjustment to the cleanup level was required to account for potential toxicity interactions with other noncarcinogens. Because the maximum concentration of lead (85.6 mg/kg) was well below the cleanup level of 400 mg/kg for lead, lead was eliminated as a COPC in the human health screening evaluation. Therefore, no unacceptable risk to human health is present at this SWMU, and a human health risk assessment is not necessary.

#### **2.6.2.2 Ecological**

Copper and zinc were not detected above their respective BVs of 14.7 and 48.8 mg/kg in any of the confirmation samples collected at SWMU 00-016 and were therefore eliminated as COPCs in the ecological screening assessment. Lead was reported above its BV of 22.3 mg/kg in 16 of the 30 confirmation samples collected from the firing range exposure area, with concentrations ranging from 23.7 to 85.6 mg/kg. The firing range exposure area consists of the range floor, the utility right-of-way, the pond location, and the first-order drainages. Lead was also reported above its BV in 6 of the 18 confirmation samples collected from the back exposure area with concentrations ranging from 28.4 to 58.6 mg/kg. The

back exposure area encompasses approximately 1.25 acres of ponderosa pine forest and consists of the descending slope north of the firing range, which runs to an ephemeral drainage channel (a branch of Rendija Canyon).

Since completion of the VCA, the firing range floor area has undergone further modification to meet the needs of the private land developer. Modification included further excavation and soil removal to promote the desired grade for proper surface drainage and edge contouring. The area was also covered with a 1-ft layer of base course. These modifications, considered with the current land use of the site and information from the ecological scoping checklist for SWMU 00-016, support a determination that no ecological receptors are present and no viable exposure pathways or off-site transport pathways exist at this exposure area. Therefore, no ecological risk assessment is required for this exposure area.

The soil removed from the back area during VCA activities was replaced with clean topsoil, and the area was reseeded and covered with erosion-control matting. Although there appears to be limited ecological exposure potential due to covering and revegetating the area, the root zone can be penetrated by the vegetative cover. Therefore, the back area exposure unit was subjected to further ecological screening evaluation to determine if residual lead concentrations reported in confirmation soil samples presented an ecological concern. The maximum reported concentration of lead for this area exceeded the ecological screening level for only one of the nine screening receptors identified. In addition, the uncertainty analysis of this exposure area concluded that lead does not pose the potential for ecological risk at this SWMU. Therefore, no ecological risk assessment is required for this exposure area or for the entire SWMU.

### **2.6.3 Risk Assessments**

#### **2.6.3.1 Human Health**

Lead was detected above its BV in 22 of 54 confirmation samples; however, it was eliminated as a COPC because the maximum detected concentration of lead was 85.6 mg/kg, which is well below the 400-mg/kg residential cleanup level for lead. Therefore, no human health risk assessment was necessary for SWMU 00-016.

#### **2.6.3.2 Ecological**

No COPCs were identified in the ecological screening assessment conducted for SWMU 00-016. Therefore, no ecological risk assessment was necessary.

### **2.6.4 Other Applicable Assessments**

#### **2.6.4.1 Surface Water**

The ER Project has developed a procedure to assess sediment transport and erosion concerns at individual SWMUs. It provides a basis for prioritizing and scheduling actions to control the erosion of potentially contaminated soils at specific SWMUs. The procedure is a two-part evaluation. Part A is a compilation of existing analytical data for the SWMU, site maps, and knowledge-of-process information. Part B is an assessment of the erosion/sediment transport potential at the SWMU. Erosion potential is numerically rated from 1 to 100 using a matrix system. SWMUs that score below 40 have a low erosion potential; those that score from 40 to 60 have a medium erosion potential; and those that score above 60 have a high erosion potential.

A surface water assessment for SWMU 00-016 was conducted on May 14, 1997. The assessment resulted in a low score of 17.5, indicating that the site has very low erosion potential.

The assessment found no debris in any watercourse. There are no man-made or natural hydraulic structures or features that might affect the hydrology of the site. Interflow is not a suspected pathway for contaminant migration because of the relatively insoluble nature of lead, copper, and zinc. Therefore, the results of the surface water assessment indicated little potential for contaminant transport via surface water or sediment.

There are no wetlands or springs, no active or inactive local water supply and production wells in the vicinity of SWMU 00-016.

#### **2.6.4.2 Groundwater**

SWMU 00-016 presents no potential pathway for contaminant release to groundwater. The regional aquifer is approximately 875 to 1100 ft below the ground surface at TA-16 and well below the vertical extent of contamination at SWMU 00-016, which was defined. Also lead, copper, and zinc are relatively insoluble in nature.

#### **2.6.4.3 Underground Storage Tank**

This section not applicable.

#### **2.6.4.4 Other**

This section not applicable.

### **2.7 No Further Action Proposal**

#### **2.7.1 Rationale**

The VCA implemented at SWMU 00-016 involved two methods of remediation. The first method employed soil washing to remove lead bullets and fine lead fragments from the soil by density separation. The second method involved using a shaker plant to mechanically sieve the soil to remove lead bullets and fragments.

The Laboratory ER Project submitted a final VCA completion report for SWMU 00-016, dated November 1998 (LANL 1998, 59996.30) to HRMB. The VCA completion report

- documents all cleanup activities and sampling results;
- states that the confirmation sampling performed for copper, lead, and zinc (the three metals commonly found in small-arms ammunition) at SWMU 00-016 verified that residual contamination for the three metals is at concentrations that pose an acceptable level of risk under current and projected future land use; and
- proposes that this SWMU be considered for NFA under Criterion 5.

In a September 22, 1999, letter, HRMB approved the report, with comment (NMED 1999, 64564) (Attachment B). In a November 1, 1999, letter, the ER Project responded to the comments (LANL 1999, 65106) (Attachment C). In a December 1, 1999, letter, HRMB approved the Laboratory's resolution of their comments (NMED 1999, 65312) (Attachment D).

## 2.7.2 Criterion

Based on the information presented in Sections 2.2 through 2.6, SWMU 00-016 is proposed for NFA under Criterion 5.

## 2.8 Supporting Documentation Attached

Attachment A: Letter from P. Parker, October 1998. Letter from private land developer concerning use of processed soil from SWMU 00-016. (Parker 1998, 62234)

Attachment B: NMED-HRMB letter from J. Kieling, September 1999. Approval and concerns response to rejection of 00-016 VCA completion report. (NMED 1999, 64564)

Attachment C: LANL letter E/ER:99-318 from J. Canepa and T. Taylor, November 1999. Response to approval and concerns of 00-016 VCA report and revised 00-016 completion report. (LANL 1999, 65106)

Attachment D: NMED-HRMB letter from J. Bearzi, December 1999. SWMU 00-016 concerns. (NMED 1999, 65312)

## 2.9 Reference Used for Text of the Request for Permit Modification for SWMU 00-016

Environmental Restoration Project, November 1998. "Voluntary Corrective Action Completion Report for SWMU 0-016, Revision 1," Los Alamos National Laboratory Report LA-UR-97-2745, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 59996.30)

## 2.10 History of Regulatory Deliverables

LANL, November 1998: VCA completion report for SWMU 00-016, Revision 1, submitted to HRMB (ER Project 1998, 59996.30)

NMED, September 22, 1999: Approval of and two concerns about VCA completion report. (NMED 1999, 64564)

LANL, November 1, 1999: Response to concerns about VCA completion report. (LANL 1999, 65106)

NMED, December 1, 1999: Approval of LANL's response to concerns and final approval of VCA completion report. (NMED 1999, 65312)

### 2.10.1 References for Regulatory Deliverables

Environmental Restoration Project, November 1998. "Voluntary Corrective Action Completion Report for SWMU 0-016, Revision 1," Los Alamos National Laboratory Report LA-UR-97-2745, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 59996.30)

NMED (New Mexico Environment Department), September 22, 1999. "Approval and Concerns Response to Rejection of 00-016 VCA Completion Report, Los Alamos National Laboratory NM0890010515," New Mexico Environment Department-Hazardous and Radioactive Materials Bureau letter to J. Browne (Laboratory Director) and T. Taylor (DOE ER Project Manager) from J. Kieling (LANL Project Leader, HRMB), Santa Fe, New Mexico. (NMED 1999, 64564)

LANL (Los Alamos National Laboratory), November 1, 1999. "Approval and Concerns of 0-016 VCA Report and the Revised 0-016 Completion Report," Los Alamos National Laboratory letter (E/ER:99-318) to J. Bearzi (NMED-HRMB) from J. Canepa (ER Project Project Manager) and T. Taylor (DOE ER Program Manager) Los Alamos, New Mexico. (LANL 1999, 65106)

NMED (New Mexico Environment Department), December 1, 1999. "Solid Waste Management Unit 00-016 Concerns," New Mexico Environment Department-Hazardous and Radioactive Materials Bureau letter to L. Atencio (US Department of Agriculture Forest Supervisor) from J. Bearzi (Chief, HRMB), Santa Fe, New Mexico. (NMED 1999, 65312)

### **3.0 SWMU 00-033(a) FORMER UNDERGROUND STORAGE TANK**

#### **3.1 Summary**

SWMU 00-033(a) is a former UST that contained heating fuel oil. In 1995, the Laboratory ER Project implemented a VCA cleanup of this SWMU that removed the UST in accordance with NMED UST Bureau regulations. The NMED UST Bureau concurred that the site met UST Bureau closure requirements in a letter dated January 23, 1996. SWMU 00-033(a) is being proposed for NFA under NFA Criterion 4 (the site was remediated in accordance with another state and/or federal authority).

#### **3.2 Description and Operational History**

##### **3.2.1 Site Description**

Prior to VCA activities, SWMU 00-033(a) was situated on the north side of 6th Street Warehouses 3 and 4 (formerly known as the Zia Warehouses 3 and 4). The warehouses are located south of the intersection of DP Road and Trinity Drive ([Figure 3.2-1](#)). The UST was a 5000-gal. steel tank that formerly contained heating fuel oil.

##### **3.2.2 Operational History**

The SWMU 00-033(a) UST was taken out of service in 1960. From 1961 until the early 1990s, the Laboratory leased Warehouses 3 and 4 for commercial use by private businesses. From the early 1990s to the present, the warehouses have been used for the storage of Laboratory archival material.

The UST contained fuel oil that supplied the oil burner located in the boiler room of Warehouse 3. The oil burner furnished heat to both Warehouse 3 and Warehouse 4.

On November 13, 1995, the UST was excavated and removed in accordance with NMED UST Bureau regulations.

#### **3.3 Land Use**

##### **3.3.1 Current**

The site where SWMU 00-033(a) was formerly situated is located on Laboratory property near the commercial business area of Los Alamos. The area is used for light industrial activities, is not fenced, and access is not restricted. The area surrounding the location of the former UST is used by commercial businesses.

##### **3.3.2 Future/Proposed**

Within the next five years, the DOE will transfer the land parcel on which this SWMU was formerly located to the County of Los Alamos. The county has indicated that it plans to use this land parcel for commercial and/or industrial development.

Figure 3.2-1. Location of SWMU 00-033(a)

### **3.4 No Further Action Proposal**

#### **3.4.1 Rationale**

The VCA for SWMU 00-033(a) consisted of excavating and removing the UST in accordance with NMED UST Bureau regulations. The Laboratory ER Project submitted a VCA completion report for SWMU 00-033(a) (which included two other SWMUs) dated August 1996 (LANL 1996, 55203) to HRMB (submitted September 6, 1996). The VCA completion report received a request for supplemental information (RSI) from HRMB on September 24, 1997 (NMED 1997, 56682) (Attachment A). The ER Project provided the requested information to HRMB on November 18, 1997 (LANL 1997, 57020) (Attachment B). HRMB issued a notice of deficiency (NOD) for the VCA completion report on June 26, 1998 (NMED 1998, 59654) (Attachment C); however, none of the deficiencies applied to SWMU 00-033(a).

The Laboratory ER Project submitted a 45-day Minimum Site Assessment Report to the UST Bureau in January 1996. This report was submitted to HRMB as Attachment I of the Laboratory's response to HRMB's September 24, 1997, request for supplemental information. In a January 23, 1996, letter (NMED 1996, 53853) (Attachment D), the UST Bureau concurred that the site poses no immediate threat to public health or to the environment based on the following reasons:

- The horizontal and vertical extents of soil contamination were adequately defined.
- Contaminated soils were excavated and properly disposed.
- Depth to groundwater at the site is greater than 1000 ft below ground surface.

The Laboratory ER Project is proposing SWMU 00-033(a) for NFA based on

- UST Bureau concurrence; and
- in the June 26, 1998, notice of deficiency from HRMB, no deficiencies addressed SWMU 00-033(a).

#### **3.4.2 Criterion**

Based on the information presented in Sections 3.2 through 3.4, SWMU 00-033(a) is being proposed for NFA under Criterion 4.

### **3.5 Supporting Documentation Attached**

Attachment A: NMED-HRMB letter, September 24, 1997. RSI for VCA completion report. (NMED 1997, 56682)

Attachment B: LANL letter, November 18, 1997. Response to RSI for VCA completion report for PRSs 00-030(l), 00-030(m), and 00-033(a). (LANL 1997, 57020)

Attachment C: NMED-HRMB letter from R. Dinwiddie, June 26, 1998. NOD for VCA report for SWMUs 00-030(l), 00-030(m), 00-033(a). (NMED 1998, 59654)

Attachment D: NMED-UST Bureau Letter to J. Vozella, January 23, 1996. Approval of 45-day assessment report for UST at TA-0, 6th Street. (LANL 1997, 53853)

### **3.6 Reference Used for Text of the Request for Permit Modification for SWMU 00-033(a)**

Environmental Restoration Project, August 1996. "Voluntary Corrective Action Completion Report for Potential Release Sites 0-030(l), 0-030(m), 0-033(a), 6th Street Warehouse, Field Unit 1," Los Alamos National Laboratory report LA-UR-96-2901, Los Alamos, New Mexico. (Environmental Restoration Project 1996, 55203)

### **3.7 History of Regulatory Deliverables**

LANL, August 1996: VCA completion report for SWMU 00-033(a) [and PRSs 0-030(l), 0-030(m)] submitted to HRMB (ER Project 1996, 55203)

NMED, September 24, 1997: RSI for VCA completion report. (NMED 1997, 56682)

LANL, November 18, 1997: Response to RSI for VCA completion report (LANL 1997, 57020)

NMED, June 26, 1998: NOD for VCA completion report; however, none of the deficiencies addressed SWMU 00-033(a). (NMED 1998, 59654)

NMED, January 23, 1996: Approval by UST Bureau of 45-day assessment report for UST at TA-0, 6th Street. (LANL 1997, 53853)

#### **3.7.1 References for Regulatory Deliverables**

Environmental Restoration Project, August 1996. "Voluntary Corrective Action Completion Report for Potential Release Sites 0-030(l), 0-030(m), 0-033(a), 6th Street Warehouse, Field Unit 1," Los Alamos National Laboratory report LA-UR-96-2901, Los Alamos, New Mexico. (Environmental Restoration Project 1996, 55203)

NMED (New Mexico Environment Department) September 24, 1997. "Request for Supplemental Information Voluntary Corrective Action Completion Report Potential Release Sites (PRSs) 0-030(l), 0-030(m) & 0-033(a) Los Alamos National Laboratory NM0890010515," New Mexico Environment Department-Hazardous and Radioactive Materials Bureau Letter to G. T. Todd (DOE-LAAO Area Manager) and S. Hecker (Laboratory Director), Santa Fe, New Mexico. (NMED 1997, 56682)

LANL (Los Alamos National Laboratory), November 18, 1997. "Response to Request for Supplemental Information for VCA Completion Report for PRSs 0-030(l), 0-030(m), and 0-033(a) in TA-0 (Former OU 1071)," Los Alamos National Laboratory letter EM/ER:97-486, Los Alamos, New Mexico. (LANL 1997, 57020)

NMED (New Mexico Environment Department) June 26, 1998. "Notice of Deficiency for the Voluntary Corrective Action (VCA) Completion Report for SWMUs 0-030(l), 0-030(m), 0-033(a) Los Alamos National Laboratory NM0890010515," New Mexico Environment Department-Hazardous and Radioactive Materials Bureau Letter to G. T. Todd (DOE-LAAO Area Manager) and S. Hecker (Laboratory Director), Santa Fe, New Mexico. (NMED 1997, 59654)

NMED (New Mexico Environment Department), January 23, 1996. "No Further Action Required at TA-0, 6th Street Site, Los Alamos National Laboratory, Los Alamos, New Mexico," Underground Storage Tank Bureau Letter to J. Vozella (DOE-LAAO), from A. Moreland (UST Bureau geologist), Santa Fe, New Mexico. (NMED 1996, 53853)

## **4.0 SWMU 02-008(b) INACTIVE OUTFALL**

### **4.1 Summary**

The SWMU report and the RFI work plan for Operable Unit (OU) 1098 incorrectly identified SWMU 02-008(b) as an inactive photo-processing outfall from Building TA-2-4. Archival information, site visits, and engineering surveys demonstrate that this site does not exist. This site was proposed for NFA in an RFI report, which was approved by NMED in a letter dated September 23, 1997. SWMU 02-008(b) is being proposed for NFA under Criterion 1 (the site does not exist).

### **4.2 Description and Operational History**

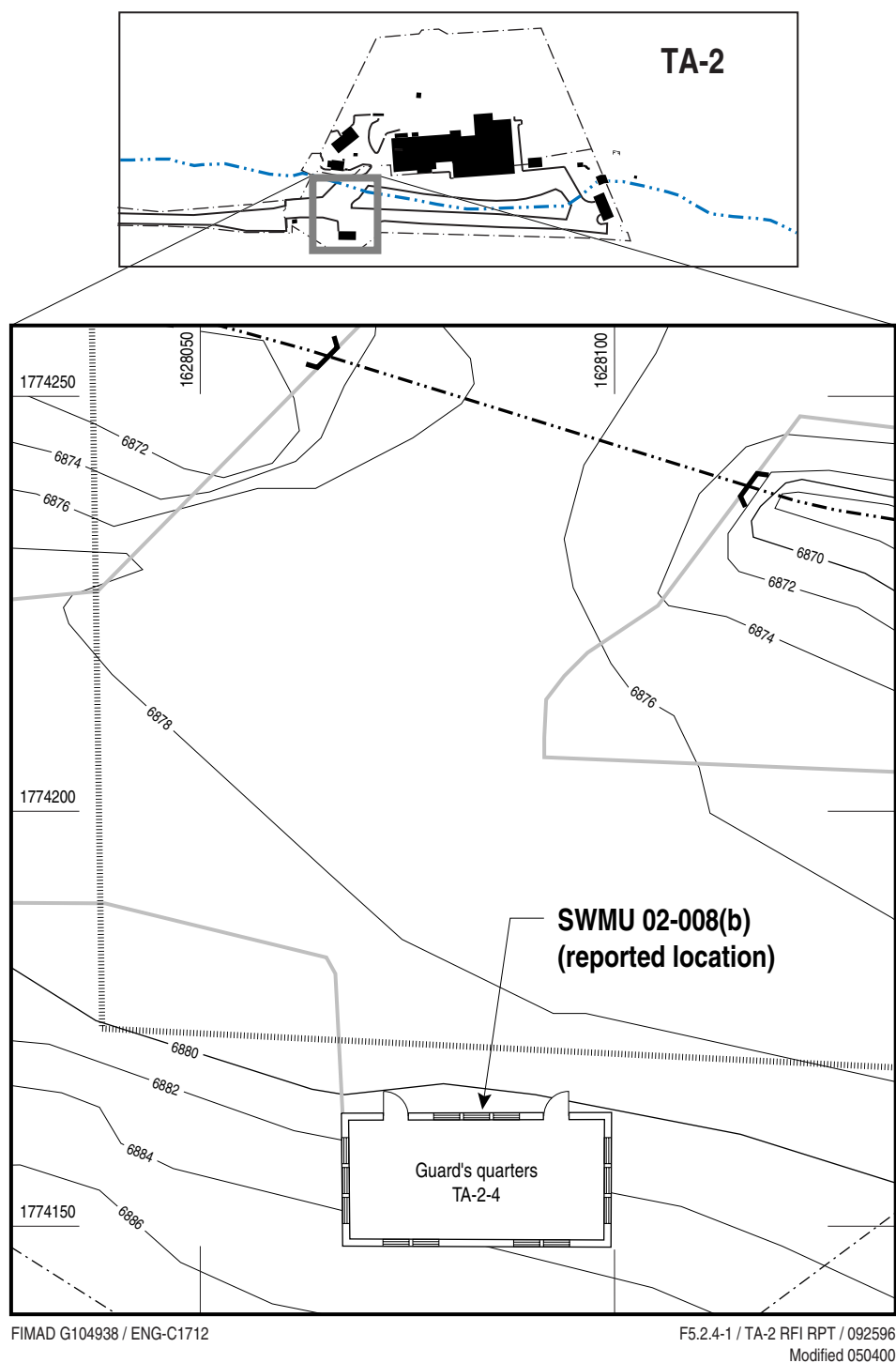
#### **4.2.1 Site Description**

SWMU 02-008(b) was identified in the SWMU report (LANL 1990, 07511, p. 2-008 (Attachment A) and the RFI work plan for OU 1098 (LANL 1993, 62956, p. 7.9-1) (Attachment B) as an inactive outfall from Building TA-2-4, which reportedly housed a photo-processing operation (i.e., a room to develop photographs of research experiments). The work plan states that the exact location of the outfall was unknown, it had been inactive for at least 10 years, and it was not listed on the Laboratory's current National Pollutant Discharge Elimination System permit. The investigating field team was unable to locate the outfall on engineering drawings of TA-2-4 or during a site visit. The RFI report for Potential Release Sites 02-004(a-f), 02-008(b) and 02-012 (LANL 1996, 55226, pp. 5-11, 5-12, 5-14) (Attachment C) reports that SWMU 02-008(b) could not be located, presents evidence documenting that SWMU does not exist, and proposes the SWMU for NFA under Criterion 1.

The investigating field team performed an engineering survey on March 9, 1995. The survey consisted of a review of existing engineering drawings and documentation and a site reconnaissance (Stellavato 1995, 54904, pp. 1, 4 of 4, 5-6) (Attachment D) to locate eight SWMUs in the vicinity of Buildings TA-2-1 and -4 (Figure 4.2-1). The survey team walked the area with the Technical Area (TA)-2 facility manager. Neither the survey team nor the facility manager was able to locate any drains inside Building TA-2-4. The team and facility manager also walked the Los Alamos Creek stream bed north of the building, moving soil and boulders as they progressed, but still were unable to locate any signs of an outfall. Next, the team checked the asphalt road north of TA-2-4 (Los Alamos Canyon Roadway), but found no signs of a cutout (which might have shown the direction of a drain, if it existed). Finally, to determine whether the outfall might have been sealed during construction of an adjacent retaining wall, personnel from Johnson Controls World Services, Inc. (JCI) were brought in to search the area with pipe locators, but no pipes were detected (Attachment D).

The nonexistence of drains or outfalls associated with Building TA-2-4 is corroborated in a 1993-1994 wastewater stream characterization study conducted by Santa Fe Engineering. The purpose of the study was to identify building drain piping, locate outfalls, and characterize wastewater flows and sources that existed throughout the Laboratory at the time of the study. Drain piping throughout the Laboratory was verified by dye checking. The wastewater stream characterization report for TA-2-4 verifies that Building TA-2-4 has no water supplies, drains, or fixtures. (Santa Fe Engineering 1993, 54956; Executive Summary, p.8, Report 63 Table, and TA-2-Site Drain Schematic) (Attachment E).

Additionally, an interview with the former supervisor of TA-2 operations (Gainer 1996, 54717) (Attachment F) established that Building TA-2-4 never housed a photo-processing laboratory and also confirmed that there is no plumbing in the building.



0 25  
FEET  
Coordinates are NMSP NAD-83



	Building or structure location		Drainage channel
	Fence		Radioactive waste line
	Paved area		

**Figure 4.2-1. Reported location of SWMU 02-008(b)**

#### **4.2.2 Operational History**

Building TA-2-4 was constructed in the late 1940s and used for guard quarters. When it was no longer needed as guard quarters, it was used for storage. In the past, the building stored graphite for shielding (Attachment F). Currently it is used to store radioactively contaminated equipment (Santa Fe Engineering, 54956, p. 8) (Attachment E). A photographic processing laboratory was not housed in Building TA-2-4, but rather in Building TA-2-1 (Attachment F), which is located approximately 150 ft northeast of Building TA-2-4.

Since 1944, TA-2 has been used continuously to house a series of small fission reactors used for research purposes. The three reactors housed at TA-2 included the water boiler, Clementine, and the Omega West Reactor. The water boiler operated from 1944 to 1974 and was decontaminated and decommissioned from 1986–87. Clementine operated from 1946 until its decommissioning in 1953. The Omega West Reactor operated from 1956 until 1993, when it was placed on standby status. The reactor is currently inactive and slated for future decommissioning sometime after the year 2000.

#### **4.3 Land Use**

##### **4.3.1 Current**

TA-2 is an industrial area with restricted access that has been operated under institutional control since 1944. A chain-link fence topped with barbed wire encloses this technical area. Access through the fence is obtained only by passing through one of two gates. Within this outer fence, access to the buildings housing the reactor is controlled by a second chain-link fence, topped with barbed wire. Access through the second fence is obtained only by passing through a badge-reader. These security measures effectively eliminate the possibility of inadvertent site intrusion.

##### **4.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-2 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Although this area will no longer be used for reactor research, it will continue to remain under institutional control.

#### **4.4 No Further Action Proposal**

##### **4.4.1 Rationale**

The attached documentation supports that the inactive photo-processing outfall from Building TA-2-4 as identified in the SWMU report actually does not exist:

- Interviews with knowledgeable site personnel have established that Building TA-2-4 did not house a photo-processing operation.
- Engineering drawings, site visits, interviews with site personnel, and the 1993 wastewater stream characterization report have established that no plumbing fixtures or drains have ever existed in Building TA-2-4.
- Neither the 1993 wastewater stream characterization study conducted by Santa Fe Engineering personnel nor a March 9, 1995, engineering survey conducted by investigating field team personnel were able to locate any signs of an outfall associated with Building TA-2-4.

A description of the investigation of SWMU 02-008(b) and an NFA proposal under Criterion 1 for this SWMU were submitted to NMED (HRMB) in the RFI report for Potential Release Sites (PRSs) 02-004(a–f), 02-008(b) and 02-012 (Attachment C). The HRMB approved the RFI report for SWMU 02-008(b) in a letter dated September 23, 1997 (NMED 1997, 56674) (Attachment G).

#### **4.4.2 Criterion**

Based on the information presented in Sections 4.2 through 4.4, SWMU 02-008(b) is being proposed for NFA under Criterion 1.

#### **4.5 Supporting Documentation Attached**

Attachment A: LANL, November 1990. SWMU report, Volume I, p. 2-008. (LANL 1990, 07511)

Attachment B: LANL, June 1993. RFI work plan for OU 1098, p. 7.9-1. (LANL 1993, 62956)

Attachment C: ER Project, September 1996. RFI report for PRSs 02-004(a–f), 02-008(b), 02-012. pp. 5-11, 5-12, 5-14. (Environmental Restoration Project 1996, 55226)

Attachment D: Stellavato, March 9, 1995. ER Project daily report form and site visit log, pp. 1, 4 of 4, 5–6. (Stellavato 1995, 54904)

Attachment E: Santa Fe Engineering, Ltd., May 1993. Wastewater stream characterization report (Santa Fe Engineering 1993, 54956)

Attachment F: LANL memorandum from G. Gainer, August 28, 1996. Conversations with Glenn Neely. (Gainer 1996, 54717)

Attachment G: NMED letter from R. Dinwiddie, September 23, 1997. Approval of RFI report, for PRSs 02-004(a–f), 02-008(b), and 02-012. (NMED 1997, 56674)

Appendix D: LANL 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

#### **4.6 Reference Used for Text of the Request for Permit Modification for SWMU 02-008(b)**

Environmental Restoration Project, September 1996. “RFI Report for Potential Release Sites 2-004(a through f), 2-008(b), 2-012 (located in former Operable Unit 1098), Field Unit 4,” Los Alamos National Laboratory report LA-UR-96-3155, Los Alamos, New Mexico, pp. 5-11, 5-12, 5-14. (Environmental Restoration Project 1996, 55226)

#### **4.7 History of Regulatory Deliverables**

LANL, September 1996: RFI report for PRSs 02-004(a–f), 02-008(b), and 02-012 submitted to HRMB. (ER Project 1996, 55226)

NMED, September 23, 1997: Approval of RFI report. (NMED 1997, 56674)

##### **4.7.1 References for Regulatory Deliverables**

Environmental Restoration Project, September 1996. “RFI Report for Potential Release Sites 2-004(a through f), 2-008(b), 2-012 (located in former Operable Unit 1098), Field Unit 4,” Los Alamos National

Laboratory report LA-UR-96-3155, Los Alamos, New Mexico, pp. 5-11, 5-12, 5-14. (Environmental Restoration Project 1996, 55226)

NMED (New Mexico Environment Department), September 23, 1997. "Approval of the RCRA Facility Investigation (RFI) Report, Potential Release Sites 2-004(a-f), 2-008(b) and 2-012, Los Alamos National Laboratory, NM890010515," NMED Letter to G. T. Todd (DOE-LAAO Area Manager) and S. Hecker (Laboratory Director), Santa Fe, New Mexico. (NMED 1997, 56674)



## **5.0 SWMU 06-003(g) INACTIVE FIRING PAD AND FOOTPRINT OF FORMER HE PROCESSING BUILDING**

### **5.1 Summary**

SWMU 06-003(g) is the location of an inactive firing pad and former high explosives (HE) processing building. ER Project field sampling demonstrated that no release of RCRA constituents occurred at this SWMU. In a letter dated March 14, 2000, the NMED concurred with NFA for this site based on no known or suspected release of RCRA constituents. SWMU 06-003(g) is being proposed for NFA under Criterion 3 (no release).

### **5.2 Description and Operational History**

#### **5.2.1 Site Description**

SWMU 06-003(g) is located on the eastern end of Twomile Mesa ([Figure 5.2-1](#)) and consists of an inactive firing pad and the adjacent concrete footings of a former building (TA-6-10).

The approximately 10-ft-square firing pad is made of gravel. At the time the pad was used, it had wooden walls 8 ft high located at its north and west sides. Steel deflector plates (0.5 in thick) were mounted on each wall.

Former Building TA-6-10 was a wood frame structure approximately 30 ft long, 12 ft wide, and 8 ft high.

The concrete footing of former Building TA-6-10 and the gravel firing pad remain, but the building itself and the firing pad walls have been removed.

Per HRMB request, SWMU 06-003(g) was consolidated with the following areas of concern: C-06-003, C-06-007, C-06-008, C-06-009, C-06-010, C-06-011, C-06-012, C-06-013, C-06-014, C-06-015, C-06-017, C-06-018, and C-06-021, which are the former locations of explosives storage magazines. The consolidated units are now designated as 06-003(g)-00

#### **5.2.2 Operational History**

TA-6 was established as part of the Laboratory's Manhattan Project in 1943 and used for the testing, development, and production of detonators.

SWMU 06-003(g) was originally used in 1943 and 1944 for testing primacord (a fuse containing HE used to initiate detonation) timing. Primacord test firing took place on the gravel firing pad for only a few months. At the conclusion of the primacord testing, Building TA-6-10 was built immediately adjacent to the firing pad. The building housed chemical processes for dissolving impure PETN (HE) in acetone or carbon tetrachloride, followed by recrystallization and drying operations. In January of 1960, Building TA-6-10 and the walls of the firing pad were removed by burning.

### **5.3 Land Use**

#### **5.3.1 Current**

SWMU 06-003(g) is located within TA-6, an industrial area with restricted access that has been operated under institutional control since 1943. A chain-link fence topped with barbed wire encloses this technical area. Access through the fence is obtained only by passing through a controlled gate. These security measures effectively eliminate the possibility of inadvertent site intrusion.

**Figure 5.2-1. Location of PRSs in the vicinity of the Eastern Aggregate**

### **5.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-6 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Thus, this area will continue to remain under institutional control.

## **5.4 No Further Action Proposal**

### **5.4.1 Rationale**

The Laboratory ER Project submitted to HRMB an RFI report for PRSs in the eastern and western aggregates at TA-6, dated September 30, 1998 (LANL 1998, 62227). The RFI report

- documents all activities and sampling results associated with SWMU 06-003(g);
- states that available data for SWMU 06-003(g) indicate that contaminants pose an acceptable level of human health and ecological risk; and
- proposes that this SWMU be considered for NFA under Criterion 5

The HRMB requested supplemental information to the RFI report in a letter dated November 4, 1999 (NMED 1999, 65053) (Attachment A). The Laboratory ER Project submitted the requested supplemental information to HRMB in a letter dated January 18, 2000 (LANL 2000, 65410) (Attachment B).

In a March 14, 2000, letter (NMED 2000, 65411) (Attachment C), HRMB approved the report and concurred with NFA for SWMU 06-003(g) under Criterion 3, rather than Criterion 5.

### **5.4.2 Criterion**

Based on the information presented in Sections 5.2 through 5.4 and NMED's March 14, 2000, letter of concurrence, SWMU 06-003(g) is being proposed for NFA under Criterion 3.

## **5.5 Supporting Documentation Attached**

Attachment A: NMED-HRMB, November 4, 1999. RSI for RFI report for eastern and western aggregates at TA-6. (NMED 1999, 65053)

Attachment B: LANL, January 18, 2000. RSI response for RFI report for eastern and western aggregates at TA-6. (LANL 2000, 65410)

Attachment C: NMED-HRMB, March 14, 2000. Approval of RFI report for TA-6. (NMED 2000, 65411)

Appendix D: LANL 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

## **5.6 Reference Used for Text of the Request for Permit Modification for SWMU 06-003(g)**

Environmental Restoration Project, September 30, 1998. "RFI Report for Potential Release Sites in the Eastern and Western Aggregates at TA-6," Los Alamos National Laboratory report LA-UR-98-3710, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 62227)

## **5.7 History of Regulatory Deliverables**

LANL, September 1998: RFI report for PRSs in the eastern and western aggregates at TA-6 submitted to HRMB. (ER Project 1998, 62227)

NMED November 4, 1999: RSI for RFI report. (NMED 1999, 65053)

LANL, January 18, 2000: RSI response for RFI report. (LANL 2000, 65410)

NMED, March 14, 2000: Approval of RFI report. (NMED 2000, 65411)

### **5.7.1 References for Regulatory Deliverables**

Environmental Restoration Project, September 30, 1998. "RFI Report for Potential Release Sites in the Eastern and Western Aggregates at TA-6," Los Alamos National Laboratory report LA-UR-98-3710, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 62227)

NMED (New Mexico Environment Department), November 4, 1999. "Supplemental Information Request RCRA Facility Investigation Report, Eastern and Western Aggregates at Technical Area 6, Los Alamos National Laboratory NM0890010515," Santa Fe, New Mexico. (NMED 1999, 65053)

LANL (Los Alamos National Laboratory), January 18, 2000. "Submittal of Response to Request for Supplemental Information (RSI) for the Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) for Potential Release Sites in the Eastern and Western Aggregates at Technical Area (TA) 6," Supplement to Los Alamos National Laboratory report LA-UR-98-3710, Los Alamos, New Mexico. (LANL 2000, 65410)

NMED (New Mexico Environment Department), March 14, 2000. "Approval of RFI Report for Technical Area (TA) 6, Los Alamos National Laboratory NM0890010515," Santa Fe, New Mexico. (NMED 2000, 65411)

## **6.0 SWMU 15-009(j) FORMER SEPTIC TANK AND ASSOCIATED SEEPAGE PITS**

### **6.1 Summary**

SWMU 15-009(j) is a former septic tank and two seepage pits that were used to process sanitary waste from Building TA-15-285. The Laboratory ER Project implemented a VCA at this SWMU. VCA activities involved remediation of the site in accordance with applicable state/federal regulations. Confirmation sampling verified that no release occurred at this site. NMED approved the VCA completion report for this SWMU in a letter dated March 16, 1999. SWMU 15-009(j) is being proposed for NFA under Criterion 3 (no release).

### **6.2 Description and Operational History**

#### **6.2.1 Site Description**

Prior to VCA activities, SWMU 15-009(j) consisted of an inactive subsurface septic tank (structure no. TA-15-286) and two inactive seepage pits. The SWMU was located near the western edge of TA-15. The septic tank was located approximately 50 ft southeast of Building TA-15-285, while the seepage pits were located approximately 15 ft and 30 ft southeast of the septic tank ([Figure 6.2-1](#)).

The former septic tank was constructed of fiberglass, had an approximate capacity of 1500 gal., and received sanitary waste from Building TA-15-285, which included drainage from a shower, toilet, sink, and water fountain. The top of the septic tank was approximately 2 ft below ground surface; the bottom, approximately 8 ft below the surface and connected to the building by 4-in. polyvinyl chloride (PVC) pipe. Its dimensions were approximately 8 ft x 4 ft x 6 ft. Discharge from the septic tank flowed to two 4-ft-diameter, 50-ft-deep seepage pits that were connected in series with the septic tank discharge line via subsurface piping. The seepage pits were uncased holes drilled into tuff and filled with stone cobbles.

#### **6.2.2 Operational History**

Building TA-15-285 housed industrial work such as electronic soldering, silver soldering, and machining, including cleaning metal spheres that contained explosives. From 1979 to 1986, parts were rinsed in an acid bath (a brightening tank) to remove excess flux from silver soldering. Rinsing in a water bath to remove the acid solution followed the acid bath rinse. Solvents were not used in this process. Workers at Building TA-15-285 used the shower facilities.

The SWMU 15-009(j) septic tank and seepage pits were constructed in 1981. The system was abandoned in place, with the inlet cut and capped at a manhole, in the fall of 1992 when the Laboratory's Sanitary Wastewater System Consolidation Plant was installed. In 1995, initial chemical characterization of the contents of the septic tank revealed a few inches of water (presumably from infiltrating precipitation) that contained detectable concentrations of metals and uranium. Because TA-15 facility management requested that the tank be removed to accommodate potential development at the site, the Laboratory ER Project implemented a VCA to remove the tank and its contents and to investigate the possible release of contaminants from the seepage pits. The VCA was conducted from July to August 1997.

**Figure 6.2-1. Location of septic tank and seepage pits at SWMU 15-009(j)**

## **6.3 Land Use**

### **6.3.1 Current**

SWMU 15-009(j) was located in TA-15, an industrial area with high-security restricted access. A chain-link fence topped with barbed wire encloses this technical area. Access through the fence is obtained only by passing through a guard gate. These security measures effectively eliminate the possibility of inadvertent site intrusion.

### **6.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-15 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Thus, this area will remain under institutional control.

## **6.4 No Further Action Proposal**

### **6.4.1 Rationale**

The VCA for SWMU 15-009(j) consisted of hydrating and removing dried sludge from the septic tank, removing the septic tank and back filling the excavation, decontaminating the interior of the septic tank, and collecting soil and tuff samples to characterize the area surrounding the septic tank. The VCA also included conducting investigative sampling at the associated seepage pits, which were left in place because no contamination was found in their vicinity. Lastly, confirmation samples were collected to verify the success of the tank removal.

The Laboratory ER Project submitted to HRMB a VCA completion report for SWMU 15-009(j), dated September 30, 1998 (LANL 1998, 59684). The VCA completion report

- documents all activities and sampling results associated with the tank removal;
- states that when excavated, the septic tank was found to be intact, indicating that no leakage around the tank occurred;
- states that the confirmation sampling performed for metals, high explosives, volatile organic compounds, semivolatile organic compounds, and uranium at SWMU 15-009(j) verified that there was no release; and
- proposes that this SWMU be considered for NFA under Criterion 3.

In a March 16, 1999, letter (NMED 1999, 65409) (Attachment A), HRMB approved the VCA report.

### **6.4.2 Criterion**

Based on the information presented in Sections 6.2 through 6.4, SWMU 15-009(j) is being proposed for NFA under Criterion 3.

## **6.5 Supporting Documentation Attached**

Attachment A: NMED-HRMB, March 16, 1999. Approval of VCA report for PRS 15-009(j). (NMED 1999, 65409)

Appendix D: LANL, 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

## **6.6 Reference Used for Text of the Request for Permit Modification for SWMU 15-009(j)**

Environmental Restoration Project, September 30, 1998. "Voluntary Corrective Action Report for Potential Release Site 15-009(j) Septic Tank," Los Alamos National Laboratory report LA-UR-98-3925, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 59684)

## **6.7 History of Regulatory Deliverables**

LANL, September 30, 1998: VCA completion report for SWMU 15-009(j) submitted to HRMB. (ER Project 1998, 59684)

NMED, March 16, 1999: Approval of VCA completion report. (NMED 1999, 65409)

### **6.7.1 References for Regulatory Deliverables**

Environmental Restoration Project, September 30, 1998. "Voluntary Corrective Action Report for Potential Release Site 15-009(j) Septic Tank," Los Alamos National Laboratory Report LA-UR-98-3925, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 59684)

NMED (New Mexico Environment Department) March 16, 1999. "Approval of the Voluntary Corrective Action Completion Report Potential Release Site 15-009(j), Los Alamos National Laboratory NM0890010515," NMED Letter to T. Taylor (DOE-LAAO Project Manager) and J. Browne (Laboratory Director), Santa Fe, New Mexico. (NMED 1999, 65409)

## **7.0 SWMU 15-012(a) OPERATIONAL RELEASE**

### **7.1 Summary**

The Laboratory ER Project has never been able to locate SWMU 15-012(a), a reputed operational release of vacuum pump oil. NMED concurred that this SWMU meets NFA Criterion 1 (the site cannot be located) in Attachment B (page 2) of a letter dated June 11, 1997.

### **7.2 Description and Operational History**

#### **7.2.1 Site Description**

The SWMU report describes SWMU 15-012(a) as an area where an operational release of vacuum pump oil occurred. However, the Laboratory ER Project has never been able to locate SWMU 15-012(a) (see Section 7.4.1)

#### **7.2.2 Operational History**

This section not applicable.

### **7.3 Land Use**

#### **7.3.1 Current**

TA-15 is an industrial area with high-security restricted access. A chain-link fence topped with barbed wire encloses this technical area. Access through the fence is obtained only by passing through a guard gate. These security measures effectively eliminate the possibility of inadvertent site intrusion.

#### **7.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-15 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Thus, this area will continue to remain under institutional control.

### **7.4 No Further Action Proposal**

#### **7.4.1 Rationale**

Documentation supports that SWMU 15-012(a) cannot be located:

- The SWMU report (LANL 1990, 07512) (Attachment A) describes SWMU 15-012(a) as an area where an operational release of vacuum pump oil occurred; however, no location and no associated structure number are provided. According to a footnote in the SWMU report, this SWMU is not identified in the DOE Comprehensive Environmental Assessment and Response Program (CEARP) report. The SWMU report does identify Task 24, record number 1589 (LANL 1989, 11963) (Attachment B) with this SWMU.
- The Site Database, Task 24, record number 1589 (Attachment B) confirms that no location or associated structure number is available. Site Database, Task 24: 1589 further states that the site could not be located.

Thus the Laboratory ER Project has no basis on which to find this SWMU.

Because the site for SWMU 15-012(a) cannot be located, the SWMU was proposed for NFA (under NFA Criterion 1) in the RFI report for PRSs at TA-15 (Environmental Restoration Project 1996, 62847).

Although the report received a notice of deficiency, HRMB concurred that SWMU 15-012(a) meets NFA Criterion 1 in a letter dated June 11, 1997, Attachment B, page 2 (NMED 1997, 59155) (Attachment C).

#### **7.4.2 Criterion**

Based on the information presented in Sections 7.2 through 7.4, SWMU 15-012(a) is being proposed for NFA under Criterion 1.

#### **7.5 Supporting Documentation Attached**

Attachment A: LANL, November 1990. SWMU report, Volume II, p. 15-012. (LANL 1990, 07512)

Attachment B: Site Database, Task 24, record number 1589. (LANL 1999, 11963)

Attachment C: NMED, June 11, 1997. NOD for RFI report for TA-15 with approval of NFA for SWMU 15-012(a). (NMED 1997, 59155)

Appendix D: LANL, 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

#### **7.6 Reference Used for Text of the Request for Permit Modification for SWMU 15-012(a)**

Environmental Restoration Project, May 1996. “RFI Report for Potential Release Sites at TA-15, 15-001, 15-002, 15-004(g,h), 15-005(b,c), 15-006(c,d), 15-007(a), 15-008(c,g) 15-009(a,f,i,k), 15-010(a-c), 15-011(a-c), 15-012(a), 15-014(a,b,d,e,g-l), C-15-001, C-15-005, C-15-006, C-15-007, C-15-010 and C-15-011 (located in Former Operable Unit 1086) Field Unit 2,” Los Alamos National Laboratory report LA-UR-95-1685, Los Alamos, New Mexico. (Environmental Restoration Project 1996, 62847)

#### **7.7 History of Regulatory Deliverables**

LANL, May 1996: RFI report for PRSs at TA-15 [including SWMU 15-012(a)] submitted to HRMB. (ER Project 1996, 62847)

NMED, June 11, 1997: NOD for RFI report with approval of NFA for SWMU 15-012(a). (NMED 1997, 59155)

##### **7.7.1 References for Regulatory Deliverables**

Environmental Restoration Project, May 1996. “RFI Report for Potential Release Sites at TA-15, 15-001, 15-002, 15-004(g,h), 15-005(b,c), 15-006(c,d), 15-007(a), 15-008(c,g) 15-009(a,f,i,k), 15-010(a-c), 15-011(a-c), 15-012(a), 15-014(a,b,d,e,g-l), C-15-001, C-15-005, C-15-006, C-15-007, C-15-010 and C-15-011 (located in Former Operable Unit 1086) Field Unit 2,” Los Alamos National Laboratory report LA-UR-95-1685, Los Alamos, New Mexico. (Environmental Restoration Project 1996, 62847)

NMED (New Mexico Environment Department) June 11, 1997. “Notice of Deficiency and Request for Workplan Modification, RCRA Facility Investigation Report, TA-15, Los Alamos National Laboratory NM0890010515,” NMED Letter to G. T. Todd (LAAO Area Manager) from B. Garcia (Chief, HRMB), Santa Fe, New Mexico. (NMED 1997, 59155)

## **8.0 SWMU 15-012(b) FORMER WASH AREA FOR EXPLOSIVE DEVICES**

### **8.1 Summary**

SWMU 15-012(b) is an area formerly used for washing explosive devices. The Laboratory ER Project implemented a VCA at this SWMU. VCA activities involved remediation of the site in accordance with applicable state/federal regulations. Confirmation sampling verified that residual contamination is at concentrations that pose an acceptable level of risk under current and projected future land use. NMED approved the VCA completion report for this SWMU in a letter dated March 16, 1999. SWMU 15-012(b) is being proposed for NFA under Criterion 5 (the site was remediated in accordance with state and/or federal regulations).

### **8.2 Description and Operational History**

#### **8.2.1 Site Description**

The SWMU 15-012(b) wash area was located near the western edge of TA-15, directly south of Building TA-15-376 (Figure 8.2-1). Prior to VCA activities, the SWMU consisted of an inactive wash area surrounded by a soil berm approximately 63 ft long, 20 ft wide, and 1.5 ft high.

#### **8.2.2 Operational History**

Personnel from the Laboratory's Dynamic Experimentation Division used the SWMU 15-012(b) wash area for washing debris from 6-ft-diameter heavy-walled steel spheres from the late 1970s until the 1980s. The spheres were used for explosive device containment testing. The debris washed from the spheres and the wash water from the cleaning were deposited in the bermed area. The washed spheres were stored off-site at SWMU 15-001.

An RFI conducted in 1994 found beryllium, lead, cadmium, copper, mercury, and uranium above their respective background values (BVs) in soils within the bermed area. HE was not detected by field screening methods. A human health screening assessment identified antimony, beryllium, lead, and uranium as COPCs. Based on these results, a VCA was conducted at the site from August to October of 1997.

The site is currently used as an area for parking government vehicles and equipment storage.

### **8.3 Land Use**

#### **8.3.1 Current**

SWMU 15-012(b) is located within TA-15, an industrial area with high-security restricted access. A chain-link fence topped with barbed wire encloses this technical area. Access through the fence is obtained only by passing through a guard gate. These security measures effectively eliminate the possibility of inadvertent site intrusion.

#### **8.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-15 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Thus, this area will remain under institutional control.

**Figure 8.2-1. Location of SWMU 15-012(b)**

## **8.4 Investigation Activities**

A complete and detailed discussion of all investigation activities is presented in the VCA report for the PRS 15-012(b) wash area (LANL 1998, 62228), submitted to HRMB September 30, 1998, and approved by NMED March 16, 1999. A summary of those activities is presented in Sections 8.4.1 through 8.4.3 of this request for permit modification.

### **8.4.1 Summary**

Based on the results of the 1994 RFI of SWMU 15-012(b), the ER Project implemented a VCA of the site. Post-VCA samples collected outside the bermed area confirmed that the contamination detected during the RFI was confined to the earthen berm and the area within the berm. VCA confirmation samples determined that soils containing elevated concentrations of depleted uranium, the COPC identified for this SWMU in the VCA, had been effectively removed from the site. Human health and ecological screening assessments were conducted on the data from confirmation samples collected from SWMU 15-012(b) after the VCA remediation of the site. Depleted uranium was eliminated as a COPC because its maximum detected concentration was well below the industrial cleanup level for humans and also well below ecological screening levels for ecological receptors of concern. Therefore, no human health or ecological risk assessment was necessary.

### **8.4.2 Investigation #1: RFI Investigation of SWMU 15-012(b)**

An RFI was completed for SWMU 15-012(b) in 1994. It was designed to determine if the area encompassed by the earthen berm was contaminated from sphere-washing operations. Samples were obtained from surface and subsurface depths at six locations. The RFI found that uranium, beryllium, lead, cadmium, copper, and mercury were above BVs. Field screening methods (HE spot test) did not detect the presence of HE in the surface or subsurface soils. A human health screening assessment identified antimony, beryllium, lead, and uranium as COPCs. Although an ecological screening was performed, the methodology in place at the time did not adequately determine potential ecological impacts. Samples were not collected from outside the bermed area; therefore, contaminant extent was not determined. Based on these results, a VCA was initiated to address the COPC contamination in surface and subsurface soils at SWMU 15-012(b) and determine the extent of soil contamination.

#### **8.4.2.1 Nonsampling Data Collection**

Prior to sampling, the six surface locations were screened for the presence of HE using the HE spot test, for the presence of metals using XRF, and for the presence of radionuclides using a pancake probe. The HE spot test kit revealed no samples positive for HE. Field screening was performed to screen for metals and for radionuclides prior to choosing samples for fixed-laboratory analysis.

#### **8.4.2.2 Sampling Data and Collection**

The objectives of the RFI sampling for SWMU 15-012(b) were to determine the extent, concentration, and depth profile of COPCs. Six locations were chosen based on the RFI work plan for OU 1098 (LANL 1993, 20946) and the results of a radiation survey (see Section 8.4.3.1). Prior to sampling, the six surface sampling locations were screened for the presence of HE with the LANL HE spot test.

Samples were obtained from surface (0–6 in.) and subsurface (18–24 in.) depths using the spade and scoop and hand-auguring techniques, respectively. All samples collected were sent to a mobile radioanalysis van, then to a mobile chemistry van for x-ray fluorescence spectroscopy (XRF) and laser-

induced breakdown spectroscopy (LIBS) analyses. XRF was used to screen for metals (mercury, lead, and uranium), and LIBS was used to screen for beryllium content.

The RFI work plan required that a minimum of three surface and three subsurface samples be submitted for fixed-laboratory analyses of inorganics, organics (less HE), and radionuclides. Samples submitted for fixed-laboratory analyses were selected based on the results of the screening described above. The three surface soil samples showing the highest levels of lead and uranium were sent to the fixed laboratory for analysis; samples indicating the highest levels for subsurface soils were also submitted. The highest screening values for surface and subsurface occurred at the same sampling locations.

#### **8.4.2.3 Data Gaps**

No data gaps were identified in the RFI report for SWMU 15-012(b) (ER Project 1995, 50294). The analytical results for this SWMU indicated the presence of uranium-contaminated soils. Consequently, a recommendation was made in the report to excavate and remove the contaminated soils from the site.

### **8.4.3 Investigation #2: VCA Remediation of SWMU 15-012(b)**

VCA activities for SWMU 15-012(b) were conducted from August 20 through August 27, 1997. Field screening was conducted for HE, metals, and radionuclides. Based on the field screening and observation of visible depleted uranium present in the soil matrix, VCA cleanup activities removed the uranium-contaminated soil to background levels. Contaminated soils (including the berm) were removed from the site and disposed of in accordance with applicable regulatory requirements. Several inches of base course were placed over the site, which is currently used as an area for parking government vehicles and equipment storage. After soil removal was completed, confirmation samples were collected. Results of the confirmation samples indicated that no RCRA constituents exceeded background values.

#### **8.4.3.1 Nonsampling Data Collection**

This section is not applicable for SWMU 15-012(b). All data collected during the VCA for SWMU 15-012(b) was collected from discrete sample-specific locations.

#### **8.4.3.2 Sampling Data Collection**

After VCA soil removal was completed, 14 confirmation samples were collected from 6 surface locations on August 28, 1997, to determine if any residual inorganic chemicals or isotopic uranium remained. Seven surface confirmation samples were collected in October 1997 to determine if any residual HE remained. Sixteen surface and 10 subsurface confirmation samples were collected in July 1998 to confirm the absence of contamination outside the former bermed area. Six surface samples (from the same six locations as the August 28, 1997, sampling) were also collected to obtain accurate antimony sample results (previous analytical methods did not use acceptable detection limits for antimony). Results of the confirmation samples indicated that no RCRA constituents exceeded BVs. Two additional confirmation samples were collected at depths of approximately 3 ft and 6 ft from sample location 15-3445 to determine vertical extent of depleted uranium because depleted uranium was detected above the BV at this location during the original confirmation sampling.

#### **8.4.3.3 Data Gaps**

There were no data gaps associated with the VCA of SWMU 15-012(b). Sufficient data were collected to adequately determine nature and extent (horizontal and vertical) of contamination.

## **8.5 Site Conceptual Model**

A complete and detailed discussion of the site conceptual model is presented in the VCA report for the PRS 15-012(b) wash area (LANL 1998, 62228), submitted to HRMB in September 1998. A summary of the site conceptual model is presented in Sections 8.5 through 8.5.2 of this request for permit modification.

SWMU 15-012(b) was a wash area for washing debris from steel spheres that were used for explosive device containment testing. The debris and wash water from the cleaning process were deposited within the bermed area. The primary release of contaminants was via the debris washed from the spheres and the wash water that were deposited in the bermed area. Once released to the surrounding soils, contaminants might migrate vertically and/or horizontally.

### **8.5.1 Nature and Extent of Contamination**

Prior to the RFI and VCA at SWMU 15-012(b), any residual contamination was assumed to be largely confined to the bermed area. The debris was assumed to contain metals (largely uranium, beryllium, and lead). Because the explosive tests were designed to fully consume HE and no fragments of HE were visually observed, HE was not considered as a COPC. COPC concentrations were expected to decrease with depth. RFI analytical results were consistent with this preliminary model in that uranium, beryllium, and lead were detected above their respective BVs in surface and subsurface soils. In addition, natural uranium, copper, and mercury were also detected above BVs. Of these COPCs, only depleted uranium remained following completion of the VCA. Confirmation sampling determined that the contamination detected during the RFI was confined to the earthen berm and the area within the berm. HE was not detected.

### **8.5.2 Environmental Fate**

The physiochemical properties of metals such as uranium, beryllium, lead, copper, and mercury cause them to bind to soil and move via transport of soil particles by water as opposed to moving in air because of volatilization or moving in water as dissolved chemicals. Based on this information and the presence of the 1.5 ft-high containment berm, it is unlikely that any contamination present at SWMU 15-012(b) would have the potential for off-site migration.

## **8.6 Site Assessments**

### **8.6.1 Summary**

Depleted uranium was detected above its BV in one confirmation sample for SWMU 15-012(b) following VCA remediation. However, it was eliminated as a COPC because it posed no unacceptable risk to human health. Therefore, no human health risk assessment was necessary. Because the ecological screening assessment demonstrated that no unacceptable risk to ecological receptors is present at this SWMU, an ecological risk assessment was also not necessary.

### **8.6.2 Screening Assessments**

A complete and detailed discussion of all screening assessments is presented in the VCA report for the PRS 15-012(b) wash area (LANL 1998, 62228), submitted to HRMB in September 1998. A summary of the screening assessments is presented in Sections 8.6.2.1 and 8.6.2.2 of this request for permit modification.

#### **8.6.2.1 Human Health**

The future land use for SWMU 15-012(b) is industrial. Therefore, the exposure assumption was evaluated using the nonintrusive industrial worker scenario, which assumes that people will be working at the site 8 hours a day, 250 days of the year for 25 years. The exposure pathways identified were inhalation, ingestion, and dermal contact of contaminated soil.

The data review indicated that, within and around the perimeter of the wash area, depleted uranium was greater than its BV of 5.4 mg/kg in one of the seven confirmation samples (at a concentration of 40 mg/kg). This concentration of 40 mg/kg was well below the industrial cleanup level of 1090 mg/kg for depleted uranium and also well below the residential screening action level for depleted uranium (130 mg/kg). Concentrations of depleted uranium in confirmation samples from the perimeter of the wash area and at 3-ft and 6-ft depths were all below the BV of 5.4 mg/kg.

The industrial cleanup level of 1090 mg/kg for depleted uranium was derived using the RESRAD computer code and a target dose limit of 15 mrem/yr and is consistent with DOE orders. Thus the cleanup level of 1090 mg/kg satisfies the as-low-as-reasonably-achievable (ALARA) principle to ensure that radiation dose is minimized and less than the DOE dose limit of 100 mrem/yr (proposed rule 10 CFR 843.5).

Because the maximum concentration of depleted uranium (40 mg/kg) was well below the industrial cleanup level of 1090 mg/kg for depleted uranium, depleted uranium was eliminated as a COPC in the human health screening evaluation.

The other COPCs (antimony, beryllium, copper, and lead) identified by the RFI were either undetected or detected below their respective BVs following VCA remediation.

Thus, the VCA was successful in reducing concentrations of human COPCs at SWMU 15-012(b) to concentrations below risk-based industrial cleanup levels. Because no unacceptable risk to human health was present at this SWMU, a human health risk assessment was not required.

#### **8.6.2.2 Ecological**

The VCA remediation of the wash area reduced the number and concentrations of contaminants from that found during the original RFI. Although total uranium was detected at or above the BV for soil at four (out of seven) locations within and around the perimeter of the wash area, the detected concentrations were equivalent to or below ecological screening levels for terrestrial vertebrate receptors. The uncertainty analysis indicated that site conditions and the Laboratory industrial use of the area precluded any potential ecological impacts to plants from residual uranium levels in the soil. Additionally, the uncertainty analysis indicated that there was no impact from any residual uranium levels in the soil to terrestrial vertebrate receptors.

Because no unacceptable risk to ecological receptors is present at this SWMU, an ecological risk assessment was not necessary.

### **8.6.3 Risk Assessments**

#### **8.6.3.1 Human Health**

Based on the elimination of all COPCs in the human health screening assessment for SWMU 15-012(b), no human health risk assessment was necessary.

### **8.6.3.2 Ecological**

Based on the elimination of all COPCs in the ecological screening assessment for SWMU 15-012(b), no ecological risk assessment was necessary.

### **8.6.4 Other Applicable Assessments**

#### **8.6.4.1 Surface Water**

The ER Project has developed a procedure to assess sediment transport and erosion concerns at individual SWMUs. It provides a basis for prioritizing and scheduling actions to control the erosion of potentially contaminated soils at specific SWMUs. The procedure is a two-part evaluation. Part A is a compilation of existing analytical data for the SWMU, site maps, and knowledge-of-process information. Part B is an assessment of the erosion/sediment transport potential at the SWMU. Erosion potential is numerically rated from 1 to 100 using a matrix system. SWMUs that score below 40 have a low erosion potential; those that score from 40 to 60 have a medium erosion potential; and those that score above 60 have a high erosion potential.

A surface water assessment for SWMU 15-012(b) was conducted on November 14, 1997. The assessment resulted in a low erosion matrix score of 15.3, indicating that the site has very low erosion potential.

The assessment found no debris in any watercourse. There are no man-made or natural hydraulic structures or features that might affect the hydrology of the site. Interflow is not a suspected pathway for contaminant migration because of the relatively insoluble nature of metals. Therefore, the results of the surface water assessment indicated little potential for contaminant transport via surface water or sediment.

There are no wetlands or springs, no active or inactive local water supplies, and no production wells in the vicinity of SWMU 15-012(b).

#### **8.6.4.2 Groundwater**

SWMU 15-012(b) presents no potential pathway for contaminant release to groundwater. The regional aquifer is approximately 875 to 1100 ft below the ground surface at TA-15 and well below the vertical extent of contamination at SWMU 15-012(b), which was defined.

#### **8.6.4.3 Underground Storage Tank**

This section not applicable.

#### **8.6.4.4 Other**

This section not applicable.

### **8.7 No Further Action Proposal**

#### **8.7.1 Rationale**

The VCA for SWMU 15-012(b) consisted of collecting samples to determine the extent of contamination, removing contaminated soils from the wash area, and collecting samples to confirm that cleanup goals were met.

The Laboratory ER Project submitted to HRMB a VCA completion report for SWMU 15-012(b), dated September 30, 1998 (LANL 1998, 62228). The VCA completion report

- documents all cleanup activities and sampling results;
- states that the nature and extent of contamination for SWMU 15-012(b) was adequately defined;
- states that confirmation sampling performed for beryllium, lead, cadmium, copper, mercury, and uranium at SWMU 15-012(b) verified that residual contamination for these chemicals is at concentrations that pose an acceptable level of risk under current and projected future land use; and
- proposes that this SWMU be considered for NFA under Criterion 5.

In a March 16, 1999, letter (NMED 1999, 65412) (Attachment A), HRMB approved the VCA report.

### **8.7.2 Criterion**

Based on the information presented in Sections 8.2 through 8.7, SWMU 15-012(b) is being proposed for NFA under Criterion 5.

### **8.8 Supporting Documentation Attached**

Attachment A: NMED-HRMB letter from R. Dinwiddie, March 16, 1999. Approval of VCA report for PRS 15-012(b) (NMED 1999, 65412)

Appendix D: LANL 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

### **8.9 References Used for Text of the Request for Permit Modification for SWMU 15-012(b)**

LANL (Los Alamos National Laboratory), July 1993. “RFI Work Plan for Operable Unit 1086,” Los Alamos National Laboratory report LA-UR-92-3968, Los Alamos, New Mexico. (LANL 1993, 20946)

Environmental Restoration Project, October 30, 1995. “RFI Report for Field Unit 2 (OU 1086), Potential Release Sites 15-004(b,c), 15-004(a,d), 15-004(f), 15-007(b), 15-008(a,b), 15-012(b), 15-009(e,j), C-15-004,” Los Alamos National Laboratory report LA-UR-95-3738, Los Alamos, New Mexico. (Environmental Restoration Project 1995, 50294)

Environmental Restoration Project, September 30, 1998. “Voluntary Corrective Action Report for Potential Release Site 15-012(b), Wash Area,” Los Alamos National Laboratory report LA-UR-98-4075, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 62228)

### **8.10 History of Regulatory Deliverables**

LANL, September 30, 1998: VCA completion report SWMU 15-012(b) submitted to HRMB. (ER Project 1998, 62228)

NMED, March 16, 1999: Approval of VCA completion report for PRS 15-012(b) (NMED 1999, 65412)

### **8.10.1 References for Regulatory Deliverables**

Environmental Restoration Project, September 30, 1998. "Voluntary Corrective Action Report for Potential Release Site 15-012(b), Wash Area," Los Alamos National Laboratory report LA-UR-98-4075, Los Alamos, New Mexico. (Environmental Restoration Project 1998, 62228)

NMED (New Mexico Environment Department) June 16, 1999. "Approval of the Voluntary Corrective Action Report, Potential Release Site 15-012(b), Los Alamos National Laboratory NM0890010515," NMED Letter to T. Taylor (LAAO Project Manager) and B. Browne (Laboratory Director) from R. Dinwiddie (RPMP Manager, HRMB), Santa Fe, New Mexico. (NMED 1999, 65412)



## **9.0 SWMU 21-005 FORMER NITRIC ACID PIT**

### **9.1 Summary**

SWMU 21-005 is the former location of a nitric acid pit used to destroy classified documents. The pit was removed in 1967. ER Project RFI activities at this SWMU involved characterization of the site in accordance with applicable state/federal regulations. RFI sampling verified that the nature and extent of contamination was defined and all detected analytes were eliminated as COPCs. Screening assessment results indicate that potential releases from the pit do not pose adverse impacts to human health or the environment under current and projected future land use. NMED approved the RFI report recommending this SWMU for NFA in a letter dated April 5, 2000. SWMU 21-005 is being proposed for NFA under Criterion 5 (the site was characterized in accordance with state and/or federal regulations).

### **9.2 Description and Operational History**

#### **9.2.1 Site Description**

SWMU 21-005 is a decommissioned former nitric acid pit (TA-21-70). The site is located in TA-21 on DP Mesa near Buildings TA-21-30 and TA-21-31 ([Figure 9.2-1](#)). The area is entirely on DOE property and behind a locked fence. The pit consisted of a reinforced concrete box with inside dimensions of 3 ft square by 4 ft deep; it was covered with a steel plate. The total area covered by the SWMU and the surrounding area of investigation is roughly 225 ft<sup>2</sup>. No inlet or outlet piping was connected to the acid pit. Observations during the field investigation (Section 9.4.2) indicate that the pit was formed and poured in place using the tuff bedrock as the outside form. Many septic tanks and similar structures at the Laboratory were constructed in this manner during the mid-1940s.

#### **9.2.2 Operational History**

The SWMU 21-005 nitric acid pit was constructed in 1946 to dissolve classified documents. The pit contained an unknown volume of nitric acid. The concentration of the acid used in the pit is not known. Nor is it known if the pit was ever pumped out during the period that it was in use. The pit was partially removed in 1967. Instructions to the workers who removed the concrete pit called for absorbing the acid within the pit and excavating around the sides of the pit before lifting it out in one piece. The amount of material used to absorb the acid within the pit is not known. It is assumed that clean fill was used to backfill the resulting excavation.

### **9.3 Land Use**

#### **9.3.1 Current**

TA-21 is an industrial area that is currently undergoing decontamination and decommissioning. SWMU 21-005 is under DOE control and located behind a locked chain-link fence. Currently, the Johnson Controls Northern New Mexico roads and grounds group is using the site as a parking area for vehicles and ground maintenance equipment.

#### **9.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-21 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Additionally, the TA-21 work plan and land transfer proposals assume future land use of TA-21 to be industrial.

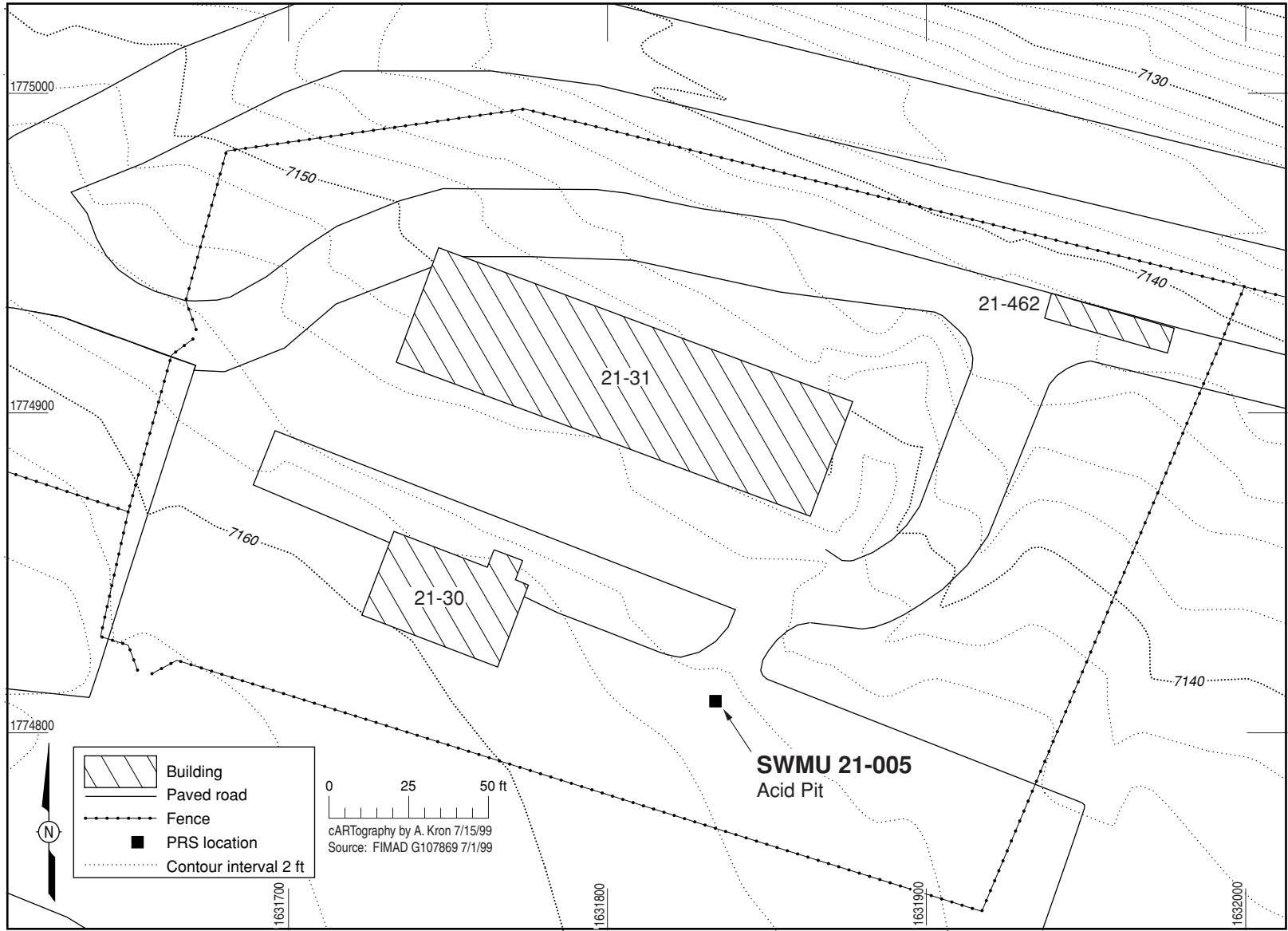


Figure 9.2-1. Site map of SWMU 21-005

F2.2-1 / 21-005 RFI RPT / 011400 / PTM  
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9-2  
SWMU 21-005

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## 9.4 Investigation Activities

A complete and detailed discussion of all investigation activities is presented in the RFI report for SWMU 21-005 (LANL 2000, 65327) submitted to NMED-HRMB on January 18, 2000, and approved by NMED April 5, 2000. A summary of those activities is presented in Sections 9.4.1 through 9.4.3 of this request for permit modification.

### 9.4.1 Summary

The location of the former acid pit was originally estimated based on Laboratory engineering drawings. Excavation (with a backhoe) of the presumed location found that the bottom of the pit had been left in place and covered with fill material. The bottom of the pit was removed from the excavation, and drilling and sampling were performed to characterize the SWMU. Human health and ecological screening assessments were conducted on the data from RFI samples. The human health screening assessment indicated that COPCs retained by the data review did not pose an unacceptable risk to human health. The ecological screening assessment did not identify any chemicals of potential ecological concern. Therefore, no human health or ecological risk assessment was necessary.

### 9.4.2 Investigation #1: RFI Investigation of SWMU 21-005

The objectives of the RFI were to determine the location of the acid pit (structure TA-21-70); identify if contaminants were present; and, if contaminants were identified, determine their lateral and vertical extent.

RFI activities at SWMU 21-005 began on June 3, 1999, and concluded on June 15, 1999. A review was conducted of historical records, including maps, engineering drawings, and reports in order to determine an approximate location of the pit. Site visits were conducted to substantiate the available information and existing site conditions. A geodetic survey of the site was performed to confirm the size and position of buildings. The approximate pit location was estimated from historical research.

A reinforced concrete slab was identified directly north of the first exploratory borings beneath 6 in. of asphalt and 1.5 ft of fill. After excavating an area approximately 10 ft square with the backhoe and digging by hand with a shovel, the entire slab was uncovered. The slab was approximately 4 ft square with the uppermost surface approximately level. The surface appeared etched, and the outline of the missing vertical walls was visible. Based on the location of this slab, the etched appearance of the concrete and outline of the former walls, it was determined that the slab was the bottom of the former acid pit. Apparently, the bottom of the acid pit structure became detached from the rest during removal and was left in place. Examination of the excavation showed no sign of any stained soils or tuff surrounding the slab. It is assumed that the soil/absorbent used to soak up any acid within the pit was removed from the excavation either before or after the sides of the concrete box detached from the bottom.

Drilling and sampling began on the afternoon of June 14, 1999, and was completed June 15, 1999. Five borings were drilled; one in the center of the pit and four surrounding it.

#### 9.4.2.1 Nonsampling Data Collection

This section is not applicable for SWMU 21-005. All data collected during the RFI for SWMU 21-005 was collected from discrete sample-specific locations.

#### **9.4.2.2 Sampling Data Collection**

Five borings were drilled, each to a total depth of 20 ft below ground surface, and were sampled at 5-ft intervals, unless areas were stained or fractured, in which case bias samples were taken. The first borehole was drilled at the center of the former pit location, and the four additional boreholes were drilled 5 ft north/northeast, south/southwest, east/northeast, and west/southwest of the pit center, placing them approximately 3 ft beyond the edge of the acid pit.

Soil pH was measured in the field at each 2.5-ft interval of the five 20-ft cores. Commercially prepared deionized water and pH paper were used. The initial pH of the water was measured using pH paper and was determined to be 5.0. Equal volumes of tuff and deionized water were placed in decontaminated glass jars and allowed to equilibrate for a minimum of 20 min. The pH of the water and tuff were then measured with pH paper. All samples measured had pHs of 5 to 7 showing that the pH of the tuff at SWMU 21-005 is not acidic.

Twenty-two core samples were collected at SWMU 21-005, four from each of five boreholes and a field duplicate. All of the samples were analyzed for gross alpha, beta, and gamma radiation; gamma-emitting radionuclides; isotopic plutonium; isotopic uranium; target analyte list metals including mercury; nitrates; PCBs; volatile organic compounds; and semivolatile organic compounds.

#### **9.4.2.3 Data Gaps**

There were no data gaps associated with the VCA of SWMU 21-005. Sufficient data were collected to adequately determine nature and extent (horizontal and vertical) of contamination.

### **9.5 Site Conceptual Model**

A complete and detailed discussion of the site conceptual model is presented in the RFI report for SWMU 21-005 (LANL 2000, 65327) submitted to NMED-HRMB in January 2000. A summary of the site conceptual model is presented in Sections 9.5 through 9.5.2 of this request for permit modification.

Work orders for the removal of the acid pit, dated November 2, 1966, stated the need to add soil to absorb the acid in the pit, implying that there was still acid in the pit and that the integrity of the pit was still intact. There are no documented releases from the acid pit during the time of its use, and it is not known if the pit was periodically pumped out. However, in the 21 years the pit remained in the ground, acid may have degraded the concrete resulting in a release to the subsurface. If releases did occur from the pit, the COPCs would include inorganic chemicals, nitrates, and low pH corrosive soils. Any leakage from the pit would have been an aqueous solution, which would preferentially migrate downward into the vadose zone. Migration of any contaminants through the vadose zone would be by way of leaching and/or dispersion. Highly corrosive soils were not anticipated because carbonates within the basic soils (e.g., high pH) would aid in the neutralization of any released acid. Any residual nitrates would have biodegraded since the removal of the pit in 1967.

Because the former location of the pit is now under asphalt pavement, there are no complete exposure pathways to potential human or ecological receptors. However, if construction were to occur in the future, workers at the site could be exposed by way of incidental ingestion of tuff, inhalation of particulates, and dermal contact with the tuff.

The RFI discovered that the acid pit had been only partially removed in 1967. Excavation performed in June 1999 revealed that the bottom of the acid pit remained in the ground. Because aluminum, barium, nickel, and selenium were detected at concentrations greater than their respective BVs in a sample

beneath the former location of the acid pit, the possibility of a release from the nitric acid pit cannot be ruled out.

The conceptual model was revised to indicate that potential exposure for on-site workers would be by way of incidental ingestion of soil and dermal contact with the soil. These pathways would only be complete if the asphalt covering was removed exposing the tuff beneath. The potential significance of the exposure would be very low because of the short exposure time of the construction workers to the soil and the low concentrations of the COPCs. For biological receptors, there would be no pathways for exposure because the asphalt-covered site precludes exposure. If construction were to occur at the site in the future, no biota would be present during excavation activities, and presumably any excavated tuff would be removed from the site.

### **9.5.1 Nature and Extent of Contamination**

Aluminum, antimony, barium, benzene, nickel, selenium, toluene, and trichloroethene are the COPCs identified by the data review. Each inorganic chemical that was detected above its BV was detected only once. Aluminum, barium, nickel, and selenium were detected (9660, 66.1, 7.9, and 0.31 mg/kg, respectively) above BVs at the 9.5- to 10-ft interval at borehole 21-11044 and could be attributed to the result of a potential release of acid to surrounding tuff from SWMU 21-005. In the next two deeper samples at that location (14.5- to 15-ft and 19.5- to 20-ft intervals), each metal was detected at less than its BV and not detected above its BV in the four surrounding boreholes. Thus, the extent from any potential release of inorganic chemicals (aluminum, barium, nickel, and selenium) from the former acid pit has been defined.

Three organic compounds were detected outside the footprint of the pit at levels below the estimated quantitation limit of 0.005 mg/kg. Benzene was detected at a depth of 14.5 ft in borehole 21-11047, trichloroethene was detected at a depth of 4.0 ft in borehole 21-11046, and toluene was detected at a depth of 9.5 ft at location 21-11046. The organic compounds were not detected beneath the former pit.

### **9.5.2 Environmental Fate**

Antimony, benzene, toluene, and trichloroethene were chemicals detected in the subsurface adjacent to this SWMU and, as stated previously, were not related to any potential release from the SWMU. Inorganic chemicals aluminum, barium, nickel, and selenium were detected above BVs beneath the bottom of the SWMU.

Analyses were performed for nitrates to determine whether or not a release from the pit had occurred. It was hypothesized that residual nitric acid from a release would result in elevated levels of nitrates. The sample results indicated no detected concentrations of nitrates at detection limits of 2.1 to 2.4 mg/kg. These data would indicate that either there was no release of nitric acid from the pit or that, if there had been a release, the nitric acid had degraded to nitrogen and oxygen.

## **9.6 Site Assessments**

### **9.6.1 Summary**

A human health screening assessment and an ecological screening assessment were conducted. The human health screening assessment indicated that COPCs retained by the data review did not pose an unacceptable risk to human health, so a human health risk assessment was not conducted. The ecological screening assessment did not identify any COPCs, so an ecological risk assessment was not performed.

## 9.6.2 Screening Assessments

A complete and detailed discussion of all screening assessments is presented in the RFI report for the SWMU 21-005 former nitric acid pit (LANL 2000, 65327), submitted to NMED-HRMB in January 2000. A summary of the screening assessments is presented in Sections 9.6.2.1 and 9.6.2.2 of this request for permit modification.

### 9.6.2.1 Human Health

The COPCs identified by the data review of the inorganic and organic chemical sample results were compared with screening action levels (SALs) to determine if the chemicals were detected at concentrations of potential concern to human health. No radionuclides were identified as COPCs in the data review. The SALs used in these comparisons were values for a residential exposure scenario, calculated using the most current toxicity values from the EPA Integrated Risk Information System (IRIS) database, standard default values, and equations (EPA 1998, 58751). The screening evaluation followed guidance provided by EPA Region 6 and NMED. The maximum concentration of each COPC was compared with the SALs for Class A, B1, and B2 carcinogens; 10 times the SAL for Class C carcinogens; or 0.1 of the SAL for noncarcinogens, if there are two or more noncarcinogenic COPCs.

The results of the RFI sampling and data review indicated that there may have been a release to the environment from the nitric acid pit. Four inorganic chemicals (aluminum, barium, nickel, and selenium) were detected (borehole 21-11044) above their BVs under the pit. The concentrations of each inorganic chemical, with the exception of aluminum, were less than 0.1 of the SAL and therefore eliminated as COPCs. These results indicate that there are no potential adverse health effects resulting from exposure to barium, nickel, and selenium at the maximum detected concentrations. Therefore, these three inorganic chemicals were not evaluated further, while aluminum required further evaluation.

One inorganic (antimony) and three organic chemicals (benzene, toluene, and trichloroethene) were detected outside of the footprint of the pit but not under the pit and were not considered to be a release from this SWMU. The concentrations of these analytes were less than 0.1 of the SAL for noncarcinogens (antimony and toluene) and less than the SAL for carcinogens (benzene and trichloroethene). Therefore, there is no potential for unacceptable risk to human health from exposure to the maximum detected concentrations of these chemicals, and they were not evaluated further.

The screening assessment is a conservative comparison based on a residential land use, while the most likely future land use for SWMU 21-005 is industrial. The site is likely to remain as industrial land use even if the land is transferred to a new owner. Therefore, the screening assessment is an overestimate of the potential risk from exposure to the COPCs because the exposure assumptions are different for an industrial scenario versus a residential scenario, i.e., individuals are potentially exposed for 8 hours/day, 250 days/year for 25 years compared with 24 hours/day, for 350 days/year for 30 years, respectively.

Based on the human health screening evaluation, aluminum was the only COPC that required further evaluation. It was detected at 9660 mg/kg at a depth of 9.5 ft to 10 ft, which is greater than the Qbt 2 BV of 7340 mg/kg as well as greater than 0.1 of the SAL of 75,000 mg/kg (i.e., 7500 mg/kg). However, a direct comparison with the SAL for aluminum (75,000 mg/kg) is appropriate at this SWMU because only one concentration of aluminum was reported above the BV and no other noncarcinogenic COPC was detected above 0.1 of its SAL. The maximum aluminum concentration is approximately 0.13 of the SAL. Furthermore, because the most likely future land use for this site is industrial, a comparison with the EPA Region 9 industrial preliminary remediation goal for aluminum is appropriate. The industrial preliminary

remediation goal is 100,000 mg/kg (EPA 1998, 58751), which is an order of magnitude greater than the maximum aluminum concentration at SWMU 21-005. Based on the above comparisons with residential as well as industrial risk values, exposure to aluminum does not pose an unacceptable risk to human health.

### **9.6.2.2 Ecological**

The basis for the problem formulation for SWMU 21-005 was the Ecological Scoping Checklist for this SWMU. This information was used to determine whether ecological receptors might be affected; identify the type of receptors that might be present (i.e., terrestrial and/or aquatic); determine whether the SWMU should be aggregated with other SWMUs/areas of concern; determine data adequacy related to nature, rate, and extent of contamination; and develop the ecological site conceptual model for the SWMU.

SWMU 21-005 is situated in a commercially developed area and lies entirely beneath an asphalt-paved parking area. Because the SWMU is subsurface, entirely covered by asphalt, and situated in a developed area, no exposure pathways are present for terrestrial and aquatic ecological receptors on or off the site. Thus there are no on-site or off-site ecological receptors. As a result, SWMU 21-005 does not present any current or potential adverse ecological impacts.

### **9.6.3 Risk Assessments**

#### **9.6.3.1 Human Health**

Based on the elimination of all COPCs in the human health screening assessment for SWMU 21-005, no human health risk assessment was needed.

#### **9.6.3.2 Ecological**

Because no exposure pathways to ecological receptors were identified in the ecological screening assessment for SWMU 21-005, no ecological risk assessment was needed.

### **9.6.4 Other Applicable Assessments**

#### **9.6.4.1 Surface Water**

The ER Project has developed a procedure to assess sediment transport and erosion concerns at individual SWMUs. It provides a basis for prioritizing and scheduling actions to control the erosion of potentially contaminated soils at specific SWMUs. The procedure is a two-part evaluation. Part A is a compilation of existing analytical data for the SWMU, site maps, and knowledge-of-process information. Part B is an assessment of the erosion/sediment transport potential at the SWMU. Erosion potential is numerically rated from 1 to 100 using a matrix system. SWMUs that score below 40 have a low erosion potential; those that score from 40 to 60 have a medium erosion potential; and those that score above 60 have a high erosion potential.

A surface water assessment for SWMU 21-005 was conducted in June 1999. The assessment resulted in a low erosion matrix score of 17.5, indicating that the site has very low erosion potential.

The assessment found no debris in any watercourse. There are no man-made or natural hydraulic structures or features that might affect the hydrology of the site. Interflow is not a suspected pathway for contaminant migration because of the relatively insoluble nature of metals. Therefore, the results of the surface water assessment indicated little potential for contaminant transport via surface water or sediment.

There are no wetlands or springs, no active or inactive local water supplies, and no production wells in the vicinity of SWMU 21-005.

#### **9.6.4.2 Groundwater**

No groundwater samples were collected from SWMU 21-005 because the regional aquifer is approximately 1100 ft below the ground surface at TA-21 and well below the vertical extent of contamination at SWMU 21-005, which was defined.

However, generic soil screening levels for the protection of groundwater were referenced to provide an indication of the potential impact of these chemicals in soil to groundwater. The generic soil screening levels were derived using default values in standardized equations presented in EPA's soil screening guidance and were obtained from the most recent EPA Region 9 guidance. Because there is no evidence of shallow perched or alluvial groundwater in the area and the regional aquifer is approximately 1100 ft below the mesa-top surface, a default dilution attenuation factor of 20 was applied to account for the natural processes that would reduce contaminant concentration before reaching the groundwater. Based on this relationship, contaminants with detected concentrations less than the generic soil screening levels would indicate that there was no potential impact to the groundwater. Because the sample results from SWMU 21-005 detected all subsurface COPCs below their generic soil screening levels, there are no potential groundwater problems for these analytes.

#### **9.6.4.3 Underground Storage Tank**

This section not applicable.

#### **9.6.4.4 Other**

This section not applicable.

### **9.7 No Further Action Proposal**

#### **9.7.1 Rationale**

The Laboratory ER Project submitted to NMED-HRMB an RFI report for SWMU 21-005, dated January, 2000 (Environmental Restoration Project 2000, 65327). The RFI report

- documents all sampling results;
- states that the nature and extent of contamination for SWMU 21-005 was adequately defined;
- states that sampling performed for aluminum, barium, and nickel at SWMU 21-005 verified that residual contamination for these chemicals is at concentrations that pose an acceptable level of risk under current and projected future land use;
- states that the single detects of benzene, toluene, trichloroethene, and antimony found outside the footprint of the acid pit are not related to a release from the pit; and
- proposes that this SWMU be considered for NFA under Criterion 5.

In an April 5, 2000, letter (NMED 2000, 65540)(Attachment A), NMED-HRMB approved the RFI report.

### **9.7.2 Criterion**

Based on the information presented in Sections 9.2 through 9.7, SWMU 21-005 is being proposed for NFA under Criterion 5.

### **9.8 Supporting Documentation Attached**

Attachment A: NMED-HRMB letter from J. Kieling, April 5, 2000. Approval of RFI report for PRS 21-005 (NMED 2000, 65540).

Appendix D: LANL 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

### **9.9 References Used for Text of the Request for Permit Modification for SWMU 21-0005**

Environmental Restoration Project, January, 2000. "RFI Report for Potential Release Site 21-005," Los Alamos National Laboratory report LA-UR-99-4655, Los Alamos, New Mexico. (Environmental Restoration Project 2000, 65327)

EPA (US Environmental Protection Agency), 1998. "Region 9 Preliminary Remediation Goals (PRGs) 1998," Environmental Protection Agency memorandum from S. Smucker, San Francisco, California. (EPA 1998, 58751)

### **9.10 History of Regulatory Deliverables**

LANL, January 18, 2000: RFI report for SWMU 21-005 submitted to HRMB. (ER Project 2000, 65327)

NMED, April 5, 2000: Approval of RFI report for SWMU 21-005 (NMED 2000, 65540).

#### **9.10.1 References for Regulatory Deliverables**

Environmental Restoration Project, January, 2000. "RFI Report for Potential Release Site 21-005," Los Alamos National Laboratory report LA-UR-99-4655, Los Alamos, New Mexico. (Environmental Restoration Project 2000, 65327)

NMED (New Mexico Environment Department) April 5, 2000. "Approval and Assessment of Fees, RFI Report for SWMU 21-005, Los Alamos National Laboratory NM0890010515, HRMB-LANL-00-001," NMED Letter to T. Taylor (LAAO Project Manager) and J. Browne (Laboratory Director) from J. Kieling (RPMP Manager, HRMB), Santa Fe, New Mexico. (NMED 2000, 65540)



## **10.0 SWMU 40-003(a) FORMER DETONATION SITE**

### **10.1 Summary**

SWMU 40-003(a) is an area formerly used for the detonation of explosive scrap materials. In 1994, the site was remediated in accordance with 40 CFR 265 under an HRMB-approved RCRA closure plan. HRMB approved the Laboratory's demonstration of clean closure for this site in a letter dated August 24, 1995. SWMU 40-003(a) is being proposed for NFA under Criterion 4 (the site was remediated in accordance with another state and/or federal authority).

### **10.2 Description and Operational History**

#### **10.2.1 Site Description**

Prior to RCRA closure, SWMU 40-003(a) was a roughly circular area, approximately 60 ft in diameter, used as a detonation area for explosive scrap materials. The site was located at the northeastern corner of TA-40, approximately 450 ft east of Building TA-40-15, and covered approximately 2 acres (Figure 10.2-1).

Repeated detonations formed a south-facing amphitheater in the northern cliff of a mesa. The north rim of the amphitheater was a cliff rising 30 ft in height. The east and west rims dropped to the south.

#### **10.2.2 Operational History**

SWMU 40-003(a) was used for the detonation of explosive scrap materials and operated from the early 1960s until April 12, 1985.

The scrap detonation site was not continually manned. Personnel were at the site only for the time needed to set up a detonation. Detonations were remotely controlled from a firing point located 1300 ft to the west. Scrap explosives and explosive-contaminated waste were delivered from other Laboratory facilities just before detonation.

Following each detonation, any scattered debris was picked up and transported to an appropriate waste disposal site. Detonated materials included scrap explosive pieces, chips, powder, and waste detonators. Soils remaining after detonation were nonreactive and nonignitable.

SWMU 40-003(a) underwent RCRA closure in 1994.

### **10.3 Land Use**

#### **10.3.1 Current**

TA-40 is an industrial area used for the research, development, and testing of HE. It is a high-security area with restricted access. A chain-link fence topped with barbed wire encloses this technical area. Access through the fence is obtained only by passing through a guard gate. These security measures effectively eliminate the possibility of inadvertent site intrusion.

#### **10.3.2 Future/Proposed**

The Laboratory does not anticipate any change from the industrial use with restricted access of TA-40 for the operational life of the Laboratory (LANL 1995, 57224, pp.11–12) (Appendix D). Thus, this area will continue to remain under institutional control.

**Figure 10.2-1. Structure Location Plan, TA-40, DF-Site**

June 2000

## **10.4 No Further Action Proposal**

### **10.4.1 Rationale**

SWMU 40-003(a) is appropriate for NFA under Criterion 4 because it was remediated in accordance with applicable state and federal regulations:

- From April 1992 through December 1994, Laboratory personnel removed and remediated SWMU 40-003(a).
- Remediation activities were performed in accordance with 40 CFR 265 under an HRMB-approved closure plan. Clean closure was demonstrated and a final closure report was submitted to HRMB on March 27, 1995.
- HRMB approved the Laboratory's demonstration of clean closure for this site in letters dated July 28, 1995, (NMED 1995, 49620) (Attachment A) and August 24, 1995 (NMED 1995, 65408) (Attachment B).

### **10.4.2 Criterion**

Based on the information presented in Sections 10.2 through 10.4, SWMU 40-003(a) is being proposed for NFA under Criterion 4.

## **10.5 Supporting Documentation Attached**

Attachment A: NMED-HRMB Letter from E. Kelley, July 28, 1995. Letter to L. Kirkman regarding conditional approval of TA-40 scrap detonation site. (NMED 1995, 49620).

Attachment B: NMED-HRMB Letter from E. Kelley, August 24, 1995. Approval of TA-40 scrap detonation final clean closure. (NMED 1995, 65408).

Appendix D: LANL 1995. Site development plan, annual update 1995, pp. 11–12. (LANL 1995, 57224)

## **10.6 Reference Used for Text of the Request for Permit Modification for SWMU 40-003(a)**

LANL (Los Alamos National Laboratory), March 1995. "Closure Certification Report for the Technical Area 40 Scrap Detonation Site," Volume I, Prepared by IT Corporation, Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL 1995, 45366)

## **10.7 History of Regulatory Deliverables**

LANL, March 1995: Closure certification report for TA-40 scrap detonation site submitted to HRMB. (LANL 1995, 45366)

NMED, August 24, 1995: Approval of TA-40 scrap detonation final clean closure. (NMED 1995, 65408)

### **10.7.1 References for Regulatory Deliverables**

LANL (Los Alamos National Laboratory), March 1995. "Closure Certification Report for the Technical Area 40 Scrap Detonation Site," Volume I, Prepared by IT Corporation, Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL 1995, 45366)

NMED (New Mexico Environment Department), August 24, 1995. "Approval of TA-40 Scrap Detonation Site Final Closure," Letter to L. Kirkman (DOE-LAAO), Santa Fe, New Mexico. (NMED 1995, 65408)

# **Appendix A**

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*Acronyms and Glossary*

## **APPENDIX A   ACRONYMS AND GLOSSARY**

### **A-1.0   ACRONYMS AND ABBREVIATIONS**

CEARP	Comprehensive Environmental Assessment and Response Program
CFR	Code of Federal Regulations
COPC	chemicals of potential concern
BV	background value
DOE	US Department of Energy
DOE-LAAO	US Department of Energy/Los Alamos Area Office
EPA	US Environmental Protection Agency
ER	Environmental Restoration (Project)
HE	high explosive
HRMB	Hazardous and Radioactive Materials Bureau
HSWA	Hazardous and Solid Waste Amendments
IRIS	Integrated Risk Information System
JCI	Johnson Controls World Services Inc.
Laboratory	Los Alamos National Laboratory
LANL	Los Alamos National Laboratory
LIBS	laser-induced breakdown spectroscopy
NFA	no further action
NMED	New Mexico Environment Department
NOD	notice of deficiency
OU	operable unit
PCB	polychlorinated biphenyl
PRS	potential release site
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFI	RCRA facility investigation
RSI	request for supplemental information
SAL	screening action level
SWMU	solid waste management unit
TA	technical area
TSCA	Toxic Substances Control Act
USFS	US Forest Service
UST	underground storage tank
VCA	voluntary corrective action
XRF	x-ray fluorescence

## A-2.0 GLOSSARY

**area of concern (AOC).** Areas at the Laboratory that might warrant further investigation for releases based on past facility waste-management activities.

**adsorption.** The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid or a liquid.

**analysis.** Includes physical analysis, chemical analysis, and knowledge-of-process determinations. (Laboratory Hazardous Waste Facility Permit)

**as low as reasonably achievable (ALARA).** An approach to radiation protection to control or manage exposures (both individual and collective) to the work force and the general public. Also to control or manage releases of radioactive material to the environment as low as social, technical, economic, practical, and public-policy considerations permit. Used in this sense, ALARA is not a dose limit.

**background level.** Naturally occurring concentrations (levels) of an inorganic chemical and naturally occurring radionuclides in soil, sediment, and tuff.

**background value (BV).** A threshold used to identify site sample results that may be greater than background levels.

**chemical of potential concern (COPC).** A chemical, detected at a site, that has the potential to adversely affect human receptors due to its concentration, distribution, and mechanism of toxicity. A COPC remains a concern until exposure pathways and receptors are evaluated in a site-specific human health risk assessment.

**cleanup levels.** Media-specific contaminant concentration levels that must be met by a selected corrective action. Cleanup levels are established by using criteria such as protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through treatment; long- and short-term effectiveness; implementability; cost; and public acceptance.

**corrective action.** Action to rectify conditions adverse to human health or the environment.

**ecological screening level (ESL).** An organism's exposure-response threshold for a given chemical constituent. The concentration of a substance in a particular medium corresponds to a hazard quotient (HQ) of 1.0 for a given organism below which no risk is indicated.

**exposure pathway.** Mode by which a receptor may be exposed to contaminants in environmental media (e.g., drinking water, ingesting food, or inhaling dust).

**exposure unit.** The bounded area or volume within which a person or other receptor may be exposed to contaminants that have been released to the environment.

**groundwater.** Water in a subsurface saturated zone; water beneath the regional water table.

**Hazardous and Solid Waste Amendments (HSWA).** The Hazardous and Solid Waste Amendments of 1984 (Public Law No. 98-616, 98 Stat. 3221), which amended the Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901 et seq.

**HSWA module.** Module VIII of the Laboratory's Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a treatment, storage, and disposal facility.

**industrial-use scenario.** Industrial use is the scenario in which current Laboratory operations continue. Any necessary remediation involves cleanup to standards designed to ensure a safe and healthy work environment for Laboratory workers.

**institutional controls.** Controls that prohibit or limit access to contaminated media: use restrictions, permitting requirements, standard operating procedures, Laboratory Implementation Requirements, Laboratory Implementation Guidance, Laboratory Performance Requirements, etc.

**migration.** The movement of inorganic and organic species through unsaturated or saturated materials.

**migration pathway.** A route (e.g., a stream or subsurface flow path) that controls the potential movement of contaminants to environmental receptors (plants, animals, humans).

**no further action (NFA).** A recommendation that no further investigation or remediation is warranted based on specific criteria.

**notice of deficiency (NOD).** A notice issued to DOE and the Laboratory by the administrative authority which states that some aspect(s) of a plan, report, or application does not meet their requirements or that requires clarification or correction.

**operable unit (OU).** At the Laboratory, one of 24 areas originally established for administering the ER Project. Set up as groups of potential release sites, the OUs were aggregated based on geographic proximity for the purpose of planning and conducting RCRA facility assessments and RCRA facility investigations. As the project matured, it became apparent that 24 were too many to allow efficient communication and to ensure consistency in approach. Therefore, in 1994, the 24 OUs were reduced to 6 administrative “field units.”

**permit modification.** A request by either the permittee or the administrative authority to change a condition of the Laboratory’s Hazardous Waste Facility Permit.

**polychlorinated biphenyls (PCBs).** Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and animals.

**potential release site (PRS).** Refers to potentially contaminated sites at the Laboratory that are identified either as solid waste management units (SWMUs) or areas of concern (AOCs). PRS refers to SWMUs and AOCs collectively.

**radionuclide.** A nuclide (species of atom) that exhibits radioactivity.

**RCRA facility investigation (RFI).** The investigation that determines if a release has occurred and the nature and extent of the contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environment Response, Compensation, and Liability Act (CERCLA) process.

**receptor.** A person, plant, animal, or geographical location that is exposed to a chemical or physical agent released to the environment by human activities.

**release.** Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment

(including the abandonment or discarding of barrels, containers, and other closed receptacles that contain any hazardous wastes or hazardous constituents).

**request for supplemental information (RSI).** A request issued to DOE and the Laboratory by the administrative authority which states that some aspect(s) of a plan or report does not meet their requirements. The ER Project must respond by providing additional information to address the identified issue or concern.

**residential-use scenario.** The standards for residential use are the most stringent of the three current- and future-use scenarios being considered by the ER Project and is the level of cleanup the EPA is currently specifying for SWMUs located off the Laboratory site and for those released for non-Laboratory use.

**Resource Conservation and Recovery Act (RCRA).** The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976. (40 CFR 270.2)

**restricted area.** Any area to which access is controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area (10 CFR 60.2).

**screening assessment.** A process designed to determine whether contamination detected in a particular medium at a site may present a potentially unacceptable human-health and /or ecological risk. The assessment utilizes screening levels that are either human-health or ecologically based concentrations derived by using chemical-specific toxicity information and standardized exposure assumptions below which no additional actions are generally warranted.

**site characterization.** Defining the pathways and methods of migration of the hazardous waste or constituents, including the media affected, the extent, direction, and speed of the contaminants, complicating factors influencing movement, concentration profiles, etc. (US Environmental Protection Agency, May 1994. "RCRA Corrective Action Plan, Final," Publication EPA-520/R-94/004, Office of Solid Waste and Emergency Response, Washington, DC)

**site conceptual model.** A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and biota that may be impacted by contamination (called receptors) and whose relationships describe qualitatively or quantitatively the release of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of contaminant by the receptors.

**solid waste management unit (SWMU).** Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated units (i.e., landfills, surface impoundments, waste piles, and land treatment units) but does not include passive leakage or one-time spills from production areas and units in which wastes have not been managed (e.g., product-storage areas).

**technical area (TA).** The Laboratory established technical areas as administrative units for all its operations. There are currently 49 active TAs spread over 43 square miles.

**underground storage tank.** [as defined in Section 9001(1) of the Solid Waste Disposal Act]. The term "underground storage tank" means any one or combination of tanks (including underground pipes connected thereto) which is used to contain an accumulation of regulated substances, and the volume

of which (including the volume of the underground pipes connected thereto) is 10% or more beneath the surface of the ground. Such term does not include any

- (a) farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
- (b) tank used for storing heating oil for consumptive use on the premises where stored;
- (c) septic tank;
- (d) pipeline facility (including gathering lines) regulated under
  - (i) the Natural Gas Pipeline Safety Act of 1968 (49 USC App. 1671 et seq.),
  - (ii) the Hazardous Liquid Pipeline Safety Act of 1979 (49 USC App. 2001 et seq.), or
  - (iii) which is an intrastate pipeline facility regulated under state laws comparable to the provisions of law referred to in Clause (i) or (ii) of this subparagraph;
- (e) surface impoundment, pit, pond, or lagoon;
- (f) stormwater or wastewater collection system;
- (g) flow-through process tank;
- (h) liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or
- (i) storage tank situated in an underground area (such as a basement, cellar, mine working, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

**unrestricted area.** Any area, access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials and any area used for residential quarters (10 CFR 60.2).

## Appendix B

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### *Requested Modifications to Tables A and B of Module VIII of the Laboratory's Hazardous Waste Facility Permit*

**Note:**

This appendix contains the requested modifications to Tables A and B of Module VIII. Table C is included, but no changes are requested for that table. The date of each request is provided next to the SWMU proposed for deletion. Strike-through text indicates deletions, and bolded text indicates new text. The number at the bottom of each technical area listing denotes the number of SWMUs on Module VIII for that area.

# Requested Modifications to Table A

<u>Technical Area 0</u>	1-007(j)	3-036(a)	<u>Technical Area 7</u>	9-009
SWMU Number	1-007(l) (30)	3-036(c)	7-001(a)	9-013
0-001		3-036(d)	7-001(b)	C-9-001 (35)
0-003	<u>Technical Area 2</u>	3-037	7-001(c)	
0-011(a)	2-005	3-038(a)	7-001(d) (4)	<u>Technical Area 10</u>
0-011(c)	2-006(a)	3-038(b)		10-001(a)
0-011(d)	2-006(b)	3-043(e)	<u>Technical Area 8</u>	10-001(b)
0-011(e)	2-007	3-044(a)	8-002	10-001(c)
0-012	2-008(a)	3-056(a)	8-003(a)	10-001(d)
<del>0-016</del> June 2000	<del>2-008(b)</del> June 2000	3-056(c) (47)	8-004(a)	10-002(a)
0-017	2-009(a)		8-004(b)	10-002(b)
0-018(a)	2-009(b)	<u>Technical Area 4</u>	8-004(c)	10-003(a)
0-019	2-009(c) <del>(9)</del> (8)	4-001	8-004(d)	10-003(b)
0-028(a)	June 2000	4-002	8-005	10-003(c)
0-028(b)		4-003(a)	8-006(a)	10-003(d)
0-030(a)	<u>Technical Area 3</u>	4-003(b) (4)	8-009(a)	10-003(e)
0-030(b)	3-001(k)		8-009(d)	10-003(f)
0-030(g)	3-002(c)	<u>Technical Area 5</u>	8-009(e)	10-003(g)
0-030(l)	3-003(a)	5-001(a)	C-8-010 (12)	10-003(h)
0-030(m)	3-003(b)	5-001(b)		10-003(i)
<del>0-033</del> June 2000	3-003(c)	5-002	<u>Technical Area 9</u>	10-003(j)
0-039 <del>(20)</del> (18)	3-009(a)	5-003	9-001(a)	10-003(k)
June 2000	3-009(c)	5-004	9-001(b)	10-003(l)
	3-009(d)	5-005(a)	9-001(c)	10-003(m)
<u>Technical Area 1</u>	3-009(g)	5-005(b)	9-001(d)	10-003(n)
1-001(a)	3-010(a)	5-006(b)	9-002	10-003(o)
1-001(b)	3-012(b)	5-006(c)	9-003(a)	10-004(a)
1-001(c)	3-013(a)	5-006(e)	9-003(b)	10-004(b)
1-001(d)	3-014(a)	5-006(h) (11)	9-003(d)	10-005
1-001(e)	3-014(b)		9-003(e)	10-006
1-001(f)	3-014(c)	<u>Technical Area 6</u>	9-003(g)	10-007 (26)
1-001(g)	3-014(d)	6-001(a)	9-003(h)	
1-001(m)	3-014(e)	6-001(b)	9-003(i)	<u>Technical Area 11</u>
1-001(o)	3-014(f)	6-002	9-004(a)	11-001(a)
1-001(s)	3-014(g)	6-003(a)	9-004(b)	11-001(b)
1-001(t)	3-014(h)	6-003(c)	9-004(c)	11-001(c)
1-001(u)	3-014(i)	6-003(d)	9-004(d)	11-002
1-002	3-014(j)	6-003(e)	9-004(e)	11-004(a)
1-003(a)	3-014(k)	6-003(f)	9-004(f)	11-004(b)
1-003(d)	3-014(l)	<del>6-003(g)</del> June 2000	9-004(g)	11-004(c)
1-003(e)	3-014(m)	6-003(h)	9-004(h)	11-004(d)
1-006(a)	3-014(n)	6-005	9-004(i)	11-004(e)
1-006(b)	3-014(o)	6-006	9-004(j)	11-005(a)
1-006(c)	3-014(p)	6-007(a)	9-004(k)	11-005(b)
1-006(d)	3-014(q)	6-007(b)	9-004(l)	11-005(c)
1-006(h)	3-014(r)	6-007(c)	9-004(m)	11-006(a)
1-006(n)	3-014(s)	6-007(d)	9-004(n)	11-006(b)
1-006(o)	3-014(t)	6-007(e)	9-004(o)	11-006(c)
1-007(a)	3-014(u)	6-007(f)	9-005(a)	11-006(d)
1-007(b)	3-015	6-007(g) <del>(19)</del> (18)	9-005(d)	11-009
1-007(c)	3-026(d)	June 2000	9-005(g)	11-011(a)
1-007(d)	3-028		9-006	11-011(b)
1-007(e)	3-033		9-008(b)	11-011(c)

## Requested Modifications to Table A

11-011(d)	(21)	15-009(g)	16-006(e)	18-003(d)	21-011(f)
		15-009(h)	16-007(a)	18-003(e)	21-011(g)
<u>Technical Area 12</u>		15-009(i)	16-008(a)	18-003(f)	21-011(i)
12-001(a)		<del>15-009(j)</del> June 2000	16-009(a)	18-003(g)	21-011(j)
12-001(b)		15-009(k)	16-010(a)	18-003(h)	21-011(k)
12-002	(3)	15-010(a)	16-010(b)	18-004(a)	21-012(b)
		15-010(b)	16-010(c)	18-004(b)	21-013(a)
<u>Technical Area 13</u>		15-010(c)	16-010(d)	18-005(a)	21-013(b)
13-001		15-011(a)	16-010(e)	18-007	21-013(c)
13-002		15-011(b)	16-010(f)	18-012(a)	21-013(d)
13-003(a)		15-011(c)	16-010(h)	18-012(b) (19)	21-013(e)
13-004	(4)	<del>15-012(a)</del> June 2000	16-010(i)		21-014
		<del>15-012(b)</del> June 2000	16-010(j)	<u>Technical Area 19</u>	21-015
<u>Technical Area 14</u>		15-014(a)	16-010(k)	19-001	21-016(a)
14-002(a)		15-014(b)	16-010(l)	19-002	21-016(b)
14-002(b)		15-014(i)	16-010(m)	19-003 (3)	21-016(c)
14-002(c)		15-014(j)	16-010(n)		21-017(a)
14-002(d)		15-014(k)	16-013	<u>Technical Area 20</u>	21-017(b)
14-002(e)		15-014(l) (44) (41)	16-016(a)	20-001(a)	21-017(c)
14-002(f)		June 2000	16-016(b)	20-001(b)	21-018(a)
14-003			16-016(c)	20-001(c)	21-018(b)
14-005		<u>Technical Area 16</u>	16-018	20-002(a)	21-021
14-006		16-001(a)	16-019	20-002(b)	21-022(a)
14-007		16-001(b)	16-020	20-002(c)	21-022(b)
14-009		16-001(c)	16-021(a)	20-002(d)	21-022(c)
14-010	(12)	16-001(d)	16-021(c)	20-003(a)	21-022(d)
		16-001(e)	16-026(b)	20-005 (9)	21-022(e)
<u>Technical Area 15</u>		16-003(a)	16-026(c)		21-022(f)
15-002		16-003(b)	16-026(d)	<u>Technical Area 21</u>	21-022(g)
15-003		16-003(c)	16-026(e)	21-002(a)	21-022(h)
15-004(a)		16-003(d)	16-026(h2)	21-003	21-022(i)
15-004(b)		16-003(e)	16-026(j2)	21-004(b)	21-022(j)
15-004(c)		16-003(f)	16-026(v)	21-004(c)	21-023(a)
15-004(f)		16-003(g)	16-029(a)	<del>21-005</del> June 2000	21-023(b)
15-004(g)		16-003(h)	16-029(b)	21-006(a)	21-023(c)
15-004(i)		16-003(i)	16-029(c)	21-006(b)	21-023(d)
15-006(a)		16-003(j)	16-029(d)	21-006(c)	21-024(a)
15-006(b)		16-003(k)	16-029(e)	21-006(d)	21-024(b)
15-006(c)		16-003(l)	16-029(f)	21-006(e)	21-024(c)
15-006(d)		16-003(m)	16-029(g)	21-007	21-024(d)
15-007(a)		16-003(n)	16-030(h)	21-010(a)	21-024(e)
15-007(b)		16-003(o)	16-035	21-010(b)	21-024(f)
15-007(c)		16-004(a)	16-036 (74)	21-010(c)	21-024(g)
15-007(d)		16-004(b)		21-010(d)	21-024(h)
15-008(a)		16-004(c)	<u>Technical Area 18</u>	21-010(e)	21-024(i)
15-008(b)		16-004(d)	18-001(a)	21-010(f)	21-024(j)
15-008(c)		16-004(e)	18-001(b)	21-010(g)	21-024(k)
15-008(d)		16-004(f)	18-001(c)	21-010(h)	21-024(l)
15-009(a)		16-005(g)	18-002(a)	21-011(a)	21-024(n)
15-009(b)		16-005(n)	18-002(b)	21-011(b)	21-024(o)
15-009(c)		16-006(a)	18-003(a)	21-011(c)	21-026(a)
15-009(e)		16-006(c)	18-003(b)	21-011(d)	21-026(b)
15-009(f)		16-006(d)	18-003(c)	21-011(e)	

**Requested Modifications to Table A**

21-027(a)	33-004(b)	35-003(o)	39-002(a)	46-003(e)
21-027(c)	33-004(c)	35-003(p)	39-004(a)	46-003(f)
21-027(d)	33-004(d)	35-003(q)	39-004(b)	46-003(g)
21-029 <del>(80)</del> (79)	33-004(g)	35-004(a)	39-004(c)	46-003(h)
June 2000	33-004(h)	35-004(b)	39-004(d)	46-004(a)
	33-004(i)	35-004(e)	39-004(e)	46-004(b)
<u>Technical Area 22</u>	33-004(j)	35-004(g)	39-005	46-004(c)
22-010(a)	33-004(k)	35-004(h)	39-006(a)	46-004(d)
22-010(b)	33-004(m)	35-006	39-007(a)	46-004(e)
22-011	33-005(a)	35-008	39-008 (12)	46-004(f)
22-012	33-005(b)	35-009(a)		46-004(g)
22-014(a)	33-005(c)	35-009(b)	<u>Technical Area 40</u>	46-004(h)
22-014(b)	33-006(a)	35-009(c)	40-001(b)	46-004(a2)
22-015(a)	33-006(b)	35-009(d)	40-001(c)	46-004(b2)
22-015(b)	33-007(a)	35-009(e)	<del>40-003(a)</del> June 2000	46-004(c2)
22-015(c)	33-007(b)	35-010(a)	40-004	46-004(d2)
22-015(d)	33-007(c)	35-010(b)	40-005	46-004(m)
22-015(e)	33-008(a)	35-010(c)	40-006(a)	46-004(p)
22-016 (12)	33-008(b)	35-010(d)	40-006(b)	46-004(q)
	33-009	35-011(a)	40-006(c)	46-004(r)
<u>Technical Area 26</u>	33-010(a)	35-013(a)	40-009	46-004(s)
26-001	33-010(b)	35-013(b)	40-010 <del>(10)</del> (9)	46-004(t)
26-002(a)	33-010(c)	35-013(c)	June 2000	46-004(u)
26-002(b)	33-010(d)	35-013(d)		46-004(v)
26-003 (4)	33-010(f)	35-014(a)	<u>Technical Area 41</u>	46-004(w)
	33-010(g)	35-014(b)	41-001	46-004(x)
<u>Technical Area 27</u>	33-010(h)	35-014(e)	41-002(a)	46-004(y)
27-001	33-011(a)	35-014(g)	41-002(b)	46-004(z)
27-002	33-011(c)	35-015(a)	41-002(c) (4)	46-005
27-003 (3)	33-011(d)	35-015(b)		46-006(a)
	33-011(e)	35-016(a)	<u>Technical Area 42</u>	46-006(b)
<u>Technical Area 31</u>	33-012(a)	35-016(c)	42-001(a)	46-006(c)
31-001 (1)	33-013	35-016(d)	42-001(b)	46-006(d)
	33-014	35-016(i)	42-001(c)	46-006(f)
<u>Technical Area 32</u>	33-015	35-016(k)	42-002(b)	46-006(g)
32-001	33-016	35-016(m)	42-003 (5)	46-007
32-002(a)	33-017 (50)	35-016(o)		46-008(a)
32-002(b) (3)		35-016(p)	<u>Technical Area 43</u>	46-008(b)
		35-016(q) (53)	43-001(a)	46-008(d)
<u>Technical Area 33</u>	<u>Technical Area 35</u>		43-002 (2)	46-008(e)
33-001(a)	35-002			46-008(f)
33-001(b)	35-003(a)	<u>Technical Area 36</u>	<u>Technical Area 45</u>	46-008(g)
33-001(c)	35-003(b)	36-001	45-001	46-009(a)
33-001(d)	35-003(c)	36-002	45-002	46-009(b)
33-001(e)	35-003(d)	36-003(a)	45-003	46-010(d) (50)
33-002(a)	35-003(e)	36-003(b)	45-003 (4)	
33-002(b)	35-003(f)	36-004(d)		
33-002(c)	35-003(g)	36-005	<u>Technical Area 46</u>	<u>Technical Area 48</u>
33-002(d)	35-003(h)	36-006	46-002	48-002(a)
33-002(e)	35-003(j)	C-36-003 (8)	46-003(a)	48-002(b)
33-003(a)	35-003(k)		46-003(b)	48-003
33-003(b)	35-003(l)	<u>Technical Area 39</u>	46-003(c)	48-004(a)
33-004(a)	35-003(m)	39-001(a)	46-003(d)	48-004(b)
	35-003(n)	39-001(b)		48-004(c)

## Requested Modifications to Table A

48-005	50-002(b)	53-006(e)	Technical Area 55	Technical Area 69
48-007(a)	50-002(c)	53-006(f)	55-008	69-001 (1)
48-007(b)	50-004(a)	53-007(a) (11)	55-009 (2)	
48-007(c)	50-004(b)			Technical Area 73
48-007(d)	50-004(c)	Technical Area 54	Technical Area 59	73-001(a)
48-007(f)	50-006(a)	54-001(a)	59-001 (1)	73-001(b)
48-010 (13)	50-006(c)	54-004 (excluding Shaft No. 9)	Technical Area 60	73-001(c)
	50-006(d)	54-005	60-002	73-001(d)
Technical Area 49	50-009	54-006	60-005(a)	73-002
49-001(a)	50-011(a) (12)	54-007(a)	60-006(a)	73-004(a)
49-001(b)		54-007(b)	60-007(a)	73-004(b)
49-001(c)	Technical Area 52	54-007(c)	60-007(b) (5)	73-004(c)
49-001(d)	52-001(d)	54-012(b)		73-004(d)
49-001(e)	52-002(a) (2)	54-013(b)	Technical Area 61	73-005
49-001(f)		54-014(b)	61-002	73-006 (11)
49-001(g)	Technical Area 53	54-014(c)	61-004(a)	
49-003	53-001(a)	54-014(d)	56.00	Total SWMUs
49-004	53-001(b)	54-015(h)	61-006	in Table A = <del>801</del> 792
49-005(a)	53-002(a)	54-015(k)	61-007 (5)	June 2000
49-006 (11)	53-002(b)	54-017		
	53-005	54-018	Technical Area 63	
Technical Area 50	53-006(b)	54-019	63-001(a)	
50-001(a)	53-006(c)	54-020 (18)	63-001(b) (2)	
50-002(a)	53-006(d)			

**Table A.1**  
**No Further Action**

## SWMUs removed from Table A through a Class III Permit Modification and date of removal

0-005	12-23-98	3-039(a)	12-23-98	16-005(o)	12-23-98	16-012(t)	12-23-98	52-002(b)	12-23-98
<b>0-016</b>		<b>6-003(g)</b>		16-006(b)	12-23-98	16-012(u)	12-23-98	52-002(c)	12-23-98
<b>0-033(a)</b>		7-003(c)	12-23-98	16-006(f)	12-23-98	16-012(v)	12-23-98	52-002(d)	12-23-98
1-001(h)	12-23-98	7-003(d)	12-23-98	16-010(g)	12-23-98	16-012(w)	12-23-98	52-002(e)	12-8-97
1-001(i)	12-23-98	8-003(b)	12-23-98	16-012(a)	12-23-98	16-012(x)	12-23-98	52-002(f)	12-23-98
1-001(j)	12-23-98	8-003(c)	12-23-98	16-012(b)	12-23-98	16-012(y)	12-23-98	53-007(b)	12-23-98
1-001(k)	12-23-98	8-006(b)	12-23-98	16-012(c)	12-23-98	16-012(z)	12-23-98	54-001(c)	12-23-98
1-001(l)	12-23-98	8-007	12-23-98	16-012(d)	12-23-98	<b>21-005</b>		54-013(a)	12-23-98
1-001(n)	12-23-98	9-003(c)	12-23-98	16-012(e)	12-23-98	21-012(a)	12-23-98		
<b>2-008(b)</b>		9-003(f)	12-23-98	16-012(f)	12-23-98	21-024(m)	12-23-98	SWMUs removed from	
3-001(a)	12-23-98	9-005(b)	12-23-98	16-012(g)	12-23-98	21-027(b)	12-23-98	Table A = <del>94</del> 100	
3-001(b)	12-23-98	9-005(c)	12-23-98	16-012(h)	12-23-98	33-004(e)	12-23-98	June 2000	
3-001(c)	12-23-98	9-005(e)	12-23-98	16-012(i)	12-23-98	33-004(f)	12-23-98		
3-002(b)	12-23-98	9-005(f)	12-23-98	16-012(j)	12-23-98	35-003(i)	12-23-98		
3-009(b)	12-23-98	9-005(h)	12-23-98	16-012(k)	12-23-98	36-003(c)	12-23-98		
3-009(e)	12-23-98	9-007	12-23-98	16-012(l)	12-23-98	39-003	12-23-98		
3-009(f)	12-23-98	11-007	12-23-98	16-012(m)	12-23-98	39-006(b)	12-23-98		
3-009(h)	12-23-98	14-004(b)	12-23-98	16-012(n)	12-23-98	40-001(a)	12-23-98		
3-012(a)	12-23-98	<b>15-009(j)</b>		16-012(o)	12-23-98	<b>40-003(a)</b>			
3-018	12-23-98	<b>15-012(a)</b>		16-012(p)	12-23-98	46-008(c)	12-23-98		
3-020(a)	12-23-98	<b>15-012(b)</b>		16-012(q)	12-23-98	52-001(a)	12-23-98		
3-035(a)	12-23-98	15-014(m)	12-23-98	16-012(r)	12-23-98	52-001(b)	12-23-98		
3-035(b)	12-23-98	16-005(i)	12-23-98	16-012(s)	12-23-98	52-001(c)	12-23-98		

**Requested Modifications to Table B**  
**Priority SWMUs\***

<u>SWMU Number</u>				
	11-004(e)	16-007	21-011(h)	36-003(a)
1-001(a)	11-005(a)	16-008(b)	21-011(i)	36-003(b)
1-001(b)	11-005(b)	16-016	21-014	39-001(a)
1-001(c)	11-006(a)	16-018	21-015	39-001(b)
1-001(d)	13-004	16-019	21-016(a)	41-001
1-001(e)	15-002	16-020	21-017(a)	46-002
1-001(f)	15-006(a)	16-021(a)	21-017(b)	46-006(a)
1-001(g)	15-006(b)	18-001(a)	21-017(c)	46-006(b)
1-001(m)	15-006(c)	18-003(a)	21-018(a)	46-006(c)
1-002	15-006(d)	18-003(b)	21-018(b)	46-006(d)
1-003(a)	15-007(a)	18-003(c)	22-015(c)	46-007
2-005	15-007(b)	18-003(d)	33-002(a)	49-001(a)
2-008(a)	15-007(c)	18-003(e)	33-002(b)	50-006(a)
3-010(a)	15-007(d)	18-003(f)	33-002(c)	50-006(c)
3-012(b)	15-008(a)	18-003(g)	33-017	50-006(d)
3-013(a)	15-008(b)	18-003(h)	35-003(a)	50-009
3-015	15-008(c)	21-006(a)	35-003(b)	54-004
3-029(a)	15-008(d)	21-006(b)	35-003(c)	(except Shaft No. 9)
5-005(a)	15-009(a)	21-006(c)	35-003(d)	54-005
6-007(a)	15-009(b)	21-006(d)	35-003(e)	54-015(h)
8-003(a)	<del>15-012(a)</del> June 2000	21-006(e)	35-003(f)	60-005(a)
9-008(a)	<del>15-012(b)</del> June 2000	21-010(a)	35-003(g)	73-001(a)
9-008(b)	15-012(c)	21-010(b)	35-003(h)	
9-009	15-012(d)	21-010(c)	35-003(j)	Total SWMUs
9-013	15-012(e)	21-010(d)	35-003(k)	in Table B = <del>164</del> <b>162</b>
10-003(a)	15-012(f)	21-010(e)	35-003(l)	<b>June 2000</b>
10-003(b)	15-012(g)	21-010(f)	35-003(m)	
10-003(c)	16-001(b)	21-010(g)	35-003(n)	* As RFI work
10-003(d)	16-001(c)	21-010(h)	35-003(o)	progresses, EPA may
10-003(e)	16-001(d)	21-011(a)	35-003(p)	identify more SWMUs
10-003(f)	16-001(e)	21-011(b)	35-003(q)	to be added to the list
10-006	16-005(n)	21-011(c)	35-006	to be addressed in the
11-004(a)	16-006(a)	21-011(d)	35-010(a)	installation work plans.
11-004(b)	16-006(c)	21-011(e)	35-010(b)	
11-004(c)	16-006(d)	21-011(f)	35-010(c)	
11-004(d)	16-006(e)	21-011(g)	35-010(d)	

**Table B.1**  
**No Further Action**

**SWMUs removed from Table B through a Class III Permit Modification and date of removal**

0-005	12-23-98	1-001(l)	12-23-98	8-003(c)	12-23-98	16-006(f)	12-23-98	SWMUs removed from Table B = <del>17</del> <b>19</b> <b>June 2000</b>
1-001(h)	12-23-98	1-001(n)	12-23-98	8-007	12-23-98	21-012(a)	12-23-98	
1-001(i)	12-23-98	3-012(a)	12-23-98	<b>15-012(a)</b>		35-003(i)	12-23-98	
1-001(j)	12-23-98	3-020(a)	12-23-98	<b>15-012(b)</b>		36-003(c)	12-23-98	
1-001(k)	12-23-98	8-003(b)	12-23-98	16-005(o)	12-23-98			

**Table C**

RFI Work Plan due July 7, 1994: Technical Area 16	16-005(a)	16-025(x)	16-034(e)	16-026(z)	3-034(b)
	16-005(b)	16-025(y)	16-034(f)	16-028(b)	3-043(c)
	16-005(c)	16-025(z)	16-034(l)	16-028(c)	3-045(a)
	16-005(d)	16-026(m)	16-034(m)	16-028(d)	3-045(b)
	16-005(e)	16-026(n)	16-034(n)	16-028(e)	3-045(c)
	16-005(h)	16-026(o)	16-034(o)	16-029(h)	3-045(e)
	16-005(j)	16-026(p)	16-034(p)	16-029(i)	3-045(f)
	16-005(k)	16-026(q)	C-16-025	16-029(j)	3-045(g)
	16-005(l)	16-026(s)	C-16-026	16-030(a)	3-045(h)
	16-005(m)	16-026(w)	Total SWMUs = 92*	16-030(b)	3-045(i)
	16-006(g)	16-028(a)	RFI Work Plan due July 7, 1995: Technical Area 16	16-030(c)	3-046
	16-006(h)	16-029(a2)		16-030(e)	3-049(a)
	16-015(a)	16-029(b2)		16-030(f)	3-049(b)
	16-015(b)	16-029(c2)		16-031(a)	3-049(c)
	16-017	16-029(d2)		16-031(b)	3-049(d)
	16-024(e)	16-029(e2)		16-031(e)	3-049(e)
	16-025(a)	16-029(f2)		16-031(f)	3-050(a)
	16-025(b)	16-029(g2)		16-031(h)	3-050(d)
	16-025(b2)	16-029(h2)		16-034(h)	3-050(e)
	16-025(c2)	16-029(k)		16-034(i)	3-050(f)
	16-025(d)	16-029(l)		16-034(j)	3-050(g)
	16-025(e)	16-029(m)		16-034(k)	3-052(a)
	16-025(f)	16-029(n)		Total SWMUs = 51	3-052(c)
	16-025(g)	16-029(o)		RFI Work Plan due May 21, 1995: Operable Unit 1114	3-052(e)
	16-025(h)	16-029(p)			3-052(f)
	16-025(i)	16-029(q)			3-054(a)
	16-025(j)	16-029(r)			3-054(b)
	16-025(k)	16-029(s)			3-054(c)
	16-025(l)	16-029(t)			3-054(d)
	16-025(m)	16-029(u)			3-054(e)
	16-025(n)	16-029(v)			3-055(a)
	16-025(o)	16-029(w)			3-055(c)
	16-025(p)	16-029(x)			3-055(d)
	16-025(q)	16-029(y)			3-056(d)
	16-025(r)	16-029(z)			3-056(l)
	16-025(s)	16-031(c)			3-056(m)
	16-025(t)	16-031(d)			3-056(n)
	16-025(u)	16-032(a)			3-059
	16-025(v)	16-032(c)			Total SWMUs = 54
	16-025(w)	16-034(a)			* 20 additional SWMUs were added after work plan review

**Table C.1****No Further Action****SWMUs removed from Table C through a Class III Permit Modification**

3-024	12-8-97	16-006(i)	12-23-98	16-026(i2)	12-23-98	16-032(e)	12-23-98	SWMUs removed from Table C = 11
3-045(d)	12-8-97	16-025(c)	12-23-98	16-031(g)	12-23-98	16-034(g)	12-23-98	
16-005(f)	12-23-98	16-025(g2)	12-23-98	16-032(d)	12-23-98			

## Appendix C

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### *Proposed Tables A and B of Module VIII of the Laboratory's Hazardous Waste Facility Permit*

**Note:**

This appendix contains proposed Tables A and B of Module VIII. The number at the bottom of each technical area listing denotes the number of SWMUs on Module VIII for that area. Table C is included, but no changes are requested for that table.

**Proposed Table A**

Technical Area 0	Technical Area 2	3-038(a)	Technical Area 8	Technical Area 10
<u>SWMU Number</u>	2-005	3-038(b)	8-002	10-001(a)
0-001	2-006(a)	3-043(e)	8-003(a)	10-001(b)
0-003	2-006(b)	3-044(a)	8-004(a)	10-001(c)
0-011(a)	2-007	3-056(a)	8-004(b)	10-001(d)
0-011(c)	2-008(a)	3-056(c) (47)	8-004(c)	10-002(a)
0-011(d)	2-009(a)		8-004(d)	10-002(b)
0-011(e)	2-009(b)	<u>Technical Area 4</u>	8-005	10-003(a)
0-012	2-009(c) (8)	4-001	8-006(a)	10-003(b)
0-017		4-002	8-009(a)	10-003(c)
0-018(a)	<u>Technical Area 3</u>	4-003(a)	8-009(d)	10-003(d)
0-019	3-001(k)	4-003(b) (4)	8-009(e)	10-003(e)
0-028(a)	3-002(c)		C-8-010 (12)	10-003(f)
0-028(b)	3-003(a)	<u>Technical Area 5</u>		10-003(g)
0-030(a)	3-003(b)	5-001(a)	<u>Technical Area 9</u>	10-003(h)
0-030(b)	3-003(c)	5-001(b)	9-001(a)	10-003(i)
0-030(g)	3-009(a)	5-002	9-001(b)	10-003(j)
0-030(l)	3-009(c)	5-003	9-001(c)	10-003(k)
0-030(m)	3-009(d)	5-004	9-001(d)	10-003(l)
0-039 (18)	3-009(g)	5-005(a)	9-002	10-003(m)
	3-010(a)	5-005(b)	9-003(a)	10-003(n)
<u>Technical Area 1</u>	3-012(b)	5-006(b)	9-003(b)	10-003(o)
1-001(a)	3-013(a)	5-006(c)	9-003(d)	10-004(a)
1-001(b)	3-014(a)	5-006(e)	9-003(e)	10-004(b)
1-001(c)	3-014(b)	5-006(h) (11)	9-003(g)	10-005
1-001(d)	3-014(c)		9-003(h)	10-006
1-001(e)	3-014(d)	<u>Technical Area 6</u>	9-003(i)	10-007 (26)
1-001(f)	3-014(e)	6-001(a)	9-004(a)	
1-001(g)	3-014(f)	6-001(b)	9-004(b)	<u>Technical Area 11</u>
1-001(m)	3-014(g)	6-002	9-004(c)	11-001(a)
1-001(o)	3-014(h)	6-003(a)	9-004(d)	11-001(b)
1-001(s)	3-014(i)	6-003(c)	9-004(e)	11-001(c)
1-001(t)	3-014(j)	6-003(d)	9-004(f)	11-002
1-001(u)	3-014(k)	6-003(e)	9-004(g)	11-004(a)
1-002	3-014(l)	6-003(f)	9-004(h)	11-004(b)
1-003(a)	3-014(m)	6-003(h)	9-004(i)	11-004(c)
1-003(d)	3-014(n)	6-005	9-004(j)	11-004(d)
1-003(e)	3-014(o)	6-006	9-004(k)	11-004(e)
1-006(a)	3-014(p)	6-007(a)	9-004(l)	11-005(a)
1-006(b)	3-014(q)	6-007(b)	9-004(m)	11-005(b)
1-006(c)	3-014(r)	6-007(c)	9-004(n)	11-005(c)
1-006(d)	3-014(s)	6-007(d)	9-004(o)	11-006(a)
1-006(h)	3-014(t)	6-007(e)	9-005(a)	11-006(b)
1-006(n)	3-014(u)	6-007(f)	9-005(d)	11-006(c)
1-006(o)	3-015	6-007(g) (18)	9-005(g)	11-006(d)
1-007(a)	3-026(d)		9-006	11-009
1-007(b)	3-028	<u>Technical Area 7</u>	9-008(b)	11-011(a)
1-007(c)	3-033	7-001(a)	9-009	11-011(b)
1-007(d)	3-036(a)	7-001(b)	9-013	11-011(c)
1-007(e)	3-036(c)	7-001(c)	C-9-001 (35)	11-011(d) (21)
1-007(j)	3-036(d)	7-001(d) (4)		
1-007(l) (30)	3-037			

**Proposed Table A**

<u>Technical Area 12</u>	15-009(h)	16-010(a)	18-003(g)	21-011(j)
12-001(a)	15-009(i)	16-010(b)	18-003(h)	21-011(k)
12-001(b)	15-009(k)	16-010(c)	18-004(a)	21-012(b)
12-002 (3)	15-010(a)	16-010(d)	18-004(b)	21-013(a)
	15-010(b)	16-010(e)	18-005(a)	21-013(b)
<u>Technical Area 13</u>	15-010(c)	16-010(f)	18-007	21-013(c)
13-001	15-011(a)	16-010(h)	18-012(a)	21-013(d)
13-002	15-011(b)	16-010(i)	18-012(b) (19)	21-013(e)
13-003(a)	15-011(c)	16-010(j)		21-014
13-004 (4)	15-014(a)	16-010(k)	<u>Technical Area 19</u>	21-015
	15-014(b)	16-010(l)	19-001	21-016(a)
<u>Technical Area 14</u>	15-014(i)	16-010(m)	19-002	21-016(b)
14-002(a)	15-014(j)	16-010(n)	19-003 (3)	21-016(c)
14-002(b)	15-014(k)	16-013		21-017(a)
14-002(c)	15-014(l) (41)	16-016(a)	<u>Technical Area 20</u>	21-017(b)
14-002(d)		16-016(b)	20-001(a)	21-017(c)
14-002(e)	<u>Technical Area 16</u>	16-016(c)	20-001(b)	21-018(a)
14-002(f)	16-001(a)	16-018	20-001(c)	21-018(b)
14-003	16-001(b)	16-019	20-002(a)	21-021
14-005	16-001(c)	16-020	20-002(b)	21-022(a)
14-006	16-001(d)	16-021(a)	20-002(c)	21-022(b)
14-007	16-001(e)	16-021(c)	20-002(d)	21-022(c)
14-009	16-003(a)	16-026(b)	20-003(a)	21-022(d)
14-010 (12)	16-003(b)	16-026(c)	20-005 (9)	21-022(e)
	16-003(c)	16-026(d)		21-022(f)
<u>Technical Area 15</u>	16-003(d)	16-026(e)	<u>Technical Area 21</u>	21-022(g)
15-002	16-003(e)	16-026(h2)	21-002(a)	21-022(h)
15-003	16-003(f)	16-026(j2)	21-003	21-022(i)
15-004(a)	16-003(g)	16-026(v)	21-004(b)	21-022(j)
15-004(b)	16-003(h)	16-029(a)	21-004(c)	21-023(a)
15-004(c)	16-003(i)	16-029(b)	21-006(a)	21-023(b)
15-004(f)	16-003(j)	16-029(c)	21-006(b)	21-023(c)
15-004(g)	16-003(k)	16-029(d)	21-006(c)	21-023(d)
15-004(i)	16-003(l)	16-029(e)	21-006(d)	21-024(a)
15-006(a)	16-003(m)	16-029(f)	21-006(e)	21-024(b)
15-006(b)	16-003(n)	16-029(g)	21-007	21-024(c)
15-006(c)	16-003(o)	16-030(h)	21-010(a)	21-024(d)
15-006(d)	16-004(a)	16-035	21-010(b)	21-024(e)
15-007(a)	16-004(b)	16-036 (74)	21-010(c)	21-024(f)
15-007(b)	16-004(c)		21-010(d)	21-024(g)
15-007(c)	16-004(d)	<u>Technical Area 18</u>	21-010(e)	21-024(h)
15-007(d)	16-004(e)	18-001(a)	21-010(f)	21-024(i)
15-008(a)	16-004(f)	18-001(b)	21-010(g)	21-024(j)
15-008(b)	16-005(g)	18-001(c)	21-010(h)	21-024(k)
15-008(c)	16-005(n)	18-002(a)	21-011(a)	21-024(l)
15-008(d)	16-006(a)	18-002(b)	21-011(b)	21-024(n)
15-009(a)	16-006(c)	18-003(a)	21-011(c)	21-024(o)
15-009(b)	16-006(d)	18-003(b)	21-011(d)	21-026(a)
15-009(c)	16-006(e)	18-003(c)	21-011(e)	21-026(b)
15-009(e)	16-007(a)	18-003(d)	21-011(f)	21-027(a)
15-009(f)	16-008(a)	18-003(e)	21-011(g)	21-027(c)
15-009(g)	16-009(a)	18-003(f)	21-011(i)	21-027(d)

**Proposed Table A**

21-029	(79)	33-004(g)	35-003(q)	39-004(a)	46-003(g)
		33-004(h)	35-004(a)	39-004(b)	46-003(h)
<u>Technical Area 22</u>		33-004(i)	35-004(b)	39-004(c)	46-004(a)
22-010(a)		33-004(j)	35-004(e)	39-004(d)	46-004(b)
22-010(b)		33-004(k)	35-004(g)	39-004(e)	46-004(c)
22-011		33-004(m)	35-004(h)	39-005	46-004(d)
22-012		33-005(a)	35-006	39-006(a)	46-004(e)
22-014(a)		33-005(b)	35-008	39-007(a)	46-004(f)
22-014(b)		33-005(c)	35-009(a)	39-008	(12) 46-004(g)
22-015(a)		33-006(a)	35-009(b)		46-004(h)
22-015(b)		33-006(b)	35-009(c)	<u>Technical Area 40</u>	46-004(a2)
22-015(c)		33-007(a)	35-009(d)	40-001(b)	46-004(b2)
22-015(d)		33-007(b)	35-009(e)	40-001(c)	46-004(c2)
22-015(e)		33-007(c)	35-010(a)	40-004	46-004(d2)
22-016	(12)	33-008(a)	35-010(b)	40-005	46-004(m)
		33-008(b)	35-010(c)	40-006(a)	46-004(p)
<u>Technical Area 26</u>		33-009	35-010(d)	40-006(b)	46-004(q)
26-001		33-010(a)	35-011(a)	40-006(c)	46-004(r)
26-002(a)		33-010(b)	35-013(a)	40-009	46-004(s)
26-002(b)		33-010(c)	35-013(b)	40-010	(9) 46-004(t)
26-003	(4)	33-010(d)	35-013(c)		46-004(u)
		33-010(f)	35-013(d)	<u>Technical Area 41</u>	46-004(v)
<u>Technical Area 27</u>		33-010(g)	35-014(a)	41-001	46-004(w)
27-001		33-010(h)	35-014(b)	41-002(a)	46-004(x)
27-002		33-011(a)	35-014(e)	41-002(b)	46-004(y)
27-003	(3)	33-011(c)	35-014(g)	41-002(c)	(4) 46-004(z)
		33-011(d)	35-015(a)		46-005
<u>Technical Area 31</u>		33-011(e)	35-015(b)	<u>Technical Area 42</u>	46-006(a)
31-001	(1)	33-012(a)	35-016(a)	42-001(a)	46-006(b)
		33-013	35-016(c)	42-001(b)	46-006(c)
<u>Technical Area 32</u>		33-014	35-016(d)	42-001(c)	46-006(d)
32-001		33-015	35-016(i)	42-002(b)	46-006(f)
32-002(a)		33-016	35-016(k)	42-003	(5) 46-006(g)
32-002(b)	(3)	33-017	(50) 35-016(m)		46-007
			35-016(o)	<u>Technical Area 43</u>	46-008(a)
<u>Technical Area 33</u>		<u>Technical Area 35</u>	35-016(p)	43-001(a)	46-008(b)
33-001(a)		35-002	35-016(q)	(53) 43-002	(2) 46-008(d)
33-001(b)		35-003(a)			46-008(e)
33-001(c)		35-003(b)	<u>Technical Area 36</u>	<u>Technical Area 45</u>	46-008(f)
33-001(d)		35-003(c)	36-001	45-001	46-008(g)
33-001(e)		35-003(d)	36-002	45-002	46-009(a)
33-002(a)		35-003(e)	36-003(a)	45-003	46-009(b)
33-002(b)		35-003(f)	36-003(b)	45-003	(4) 46-010(d)
33-002(c)		35-003(g)	36-004(d)		(50)
33-002(d)		35-003(h)	36-005	<u>Technical Area 46</u>	<u>Technical Area 48</u>
33-002(e)		35-003(j)	36-006	46-002	48-002(a)
33-003(a)		35-003(k)	C-36-003	(8) 46-003(a)	48-002(b)
33-003(b)		35-003(l)		46-003(b)	48-003
33-004(a)		35-003(m)	<u>Technical Area 39</u>	46-003(c)	48-004(a)
33-004(b)		35-003(n)	39-001(a)	46-003(d)	48-004(b)
33-004(c)		35-003(o)	39-001(b)	46-003(e)	48-004(c)
33-004(d)		35-003(p)	39-002(a)	46-003(f)	48-005

**Proposed Table A**

48-007(a)	50-002(c)	53-006(f)	Technical Area 55	Technical Area 69
48-007(b)	50-004(a)	53-007(a) (11)	55-008	69-001 (1)
48-007(c)	50-004(b)		55-009 (2)	
48-007(d)	50-004(c)	Technical Area 54		Technical Area 73
48-007(f)	50-006(a)	54-001(a)	Technical Area 59	73-001(a)
48-010 (13)	50-006(c)	54-004 (excluding	59-001 (1)	73-001(b)
	50-006(d)	Shaft No. 9)		73-001(c)
Technical Area 49	50-009	54-005	Technical Area 60	73-001(d)
49-001(a)	50-011(a) (12)	54-006	60-002	73-002
49-001(b)		54-007(a)	60-005(a)	73-004(a)
49-001(c)	Technical Area 52	54-007(b)	60-006(a)	73-004(b)
49-001(d)	52-001(d)	54-007(c)	60-007(a)	73-004(c)
49-001(e)	52-002(a) (2)	54-012(b)	60-007(b) (5)	73-004(d)
49-001(f)		54-013(b)		73-005
49-001(g)	Technical Area 53	54-014(b)	Technical Area 61	73-006 (11)
49-003	53-001(a)	54-014(c)	61-002	
49-004	53-001(b)	54-014(d)	61-004(a)	Total SWMUs
49-005(a)	53-002(a)	54-015(h)	56.00	in Table A = <b>792</b>
49-006 (11)	53-002(b)	54-015(k)	61-006	
	53-005	54-017	61-007 (5)	
Technical Area 50	53-006(b)	54-018		
50-001(a)	53-006(c)	54-019	Technical Area 63	
50-002(a)	53-006(d)	54-020 (18)	63-001(a)	
50-002(b)	53-006(e)		63-001(b) (2)	

**Table A.1  
No Further Action****SWMUs removed from Table A through a Class III Permit Modification and date of removal**

0-005	12-23-98	3-039(a)	12-23-98	16-005(o)	12-23-98	16-012(t)	12-23-98	52-002(b)	12-23-98
0-016		6-003(g)		16-006(b)	12-23-98	16-012(u)	12-23-98	52-002(c)	12-23-98
0-033(a)		7-003(c)	12-23-98	16-006(f)	12-23-98	16-012(v)	12-23-98	52-002(d)	12-23-98
1-001(h)	12-23-98	7-003(d)	12-23-98	16-010(g)	12-23-98	16-012(w)	12-23-98	52-002(e)	12-8-97
1-001(i)	12-23-98	8-003(b)	12-23-98	16-012(a)	12-23-98	16-012(x)	12-23-98	52-002(f)	12-23-98
1-001(j)	12-23-98	8-003(c)	12-23-98	16-012(b)	12-23-98	16-012(y)	12-23-98	53-007(b)	12-23-98
1-001(k)	12-23-98	8-006(b)	12-23-98	16-012(c)	12-23-98	16-012(z)	12-23-98	54-001(c)	12-23-98
1-001(l)	12-23-98	8-007	12-23-98	16-012(d)	12-23-98	21-005		54-013(a)	12-23-98
1-001(n)	12-23-98	9-003(c)	12-23-98	16-012(e)	12-23-98	21-012(a)	12-23-98		
2-008(b)		9-003(f)	12-23-98	16-012(f)	12-23-98	21-024(m)	12-23-98	SWMUs removed from	
3-001(a)	12-23-98	9-005(b)	12-23-98	16-012(g)	12-23-98	21-027(b)	12-23-98	Table A = <b>100</b>	
3-001(b)	12-23-98	9-005(c)	12-23-98	16-012(h)	12-23-98	33-004(e)	12-23-98		
3-001(c)	12-23-98	9-005(e)	12-23-98	16-012(i)	12-23-98	33-004(f)	12-23-98		
3-002(b)	12-23-98	9-005(f)	12-23-98	16-012(j)	12-23-98	35-003(i)	12-23-98		
3-009(b)	12-23-98	9-005(h)	12-23-98	16-012(k)	12-23-98	36-003(c)	12-23-98		
3-009(e)	12-23-98	9-007	12-23-98	16-012(l)	12-23-98	39-003	12-23-98		
3-009(f)	12-23-98	11-007	12-23-98	16-012(m)	12-23-98	39-006(b)	12-23-98		
3-009(h)	12-23-98	14-004(b)	12-23-98	16-012(n)	12-23-98	40-001(a)	12-23-98		
3-012(a)	12-23-98	15-009(j)		16-012(o)	12-23-98	40-003(a)			
3-018	12-23-98	15-012(a)		16-012(p)	12-23-98	46-008(c)	12-23-98		
3-020(a)	12-23-98	15-012(b)		16-012(q)	12-23-98	52-001(a)	12-23-98		
3-035(a)	12-23-98	15-014(m)	12-23-98	16-012(r)	12-23-98	52-001(b)	12-23-98		
3-035(b)	12-23-98	16-005(i)	12-23-98	16-012(s)	12-23-98	52-001(c)	12-23-98		

**Proposed Table B  
Priority SWMUs\***

<u>SWMU Number</u>				
1-001(a)	11-004(e)	16-016	21-014	39-001(a)
1-001(b)	11-005(a)	16-018	21-015	39-001(b)
1-001(c)	11-005(b)	16-019	21-016(a)	41-001
1-001(d)	11-006(a)	16-020	21-017(a)	46-002
1-001(e)	13-004	16-021(a)	21-017(b)	46-006(a)
1-001(f)	15-002	18-001(a)	21-017(c)	46-006(b)
1-001(g)	15-006(a)	18-003(a)	21-018(a)	46-006(c)
1-001(m)	15-006(b)	18-003(b)	21-018(b)	46-006(d)
1-002	15-006(c)	18-003(c)	22-015(c)	46-007
1-003(a)	15-006(d)	18-003(d)	33-002(a)	49-001(a)
2-005	15-007(a)	18-003(e)	33-002(b)	50-006(a)
2-008(a)	15-007(b)	18-003(f)	33-002(c)	50-006(c)
3-010(a)	15-007(c)	18-003(g)	33-017	50-006(d)
3-012(b)	15-007(d)	18-003(h)	35-003(a)	50-009
3-013(a)	15-008(a)	21-006(a)	35-003(b)	54-004
3-015	15-008(b)	21-006(b)	35-003(c)	(except Shaft No. 9)
3-029(a)	15-008(c)	21-006(c)	35-003(d)	54-005
5-005(a)	15-008(d)	21-006(d)	35-003(e)	54-015(h)
6-007(a)	15-009(a)	21-006(e)	35-003(f)	60-005(a)
8-003(a)	15-009(b)	21-010(a)	35-003(g)	73-001(a)
9-008(a)	15-012(c)	21-010(b)	35-003(h)	Total SWMUs in Table B = <b>162</b>
9-008(b)	15-012(d)	21-010(c)	35-003(j)	
9-009	15-012(e)	21-010(d)	35-003(k)	
9-013	15-012(f)	21-010(e)	35-003(l)	
10-003(a)	15-012(g)	21-010(f)	35-003(m)	* As RFI work progresses, EPA may identify more SWMUs to be added to the list to be addressed in the installation work plans.
10-003(b)	16-001(b)	21-010(g)	35-003(n)	
10-003(c)	16-001(c)	21-010(h)	35-003(o)	
10-003(d)	16-001(d)	21-011(a)	35-003(p)	
10-003(e)	16-001(e)	21-011(b)	35-003(q)	
10-003(f)	16-005(n)	21-011(c)	35-006	
10-006	16-006(a)	21-011(d)	35-010(a)	
11-004(a)	16-006(c)	21-011(e)	35-010(b)	
11-004(b)	16-006(d)	21-011(f)	35-010(c)	
11-004(c)	16-006(e)	21-011(g)	35-010(d)	
11-004(d)	16-007	21-011(h)	36-003(a)	
	16-008(b)	21-011(i)	36-003(b)	

**Table B.1  
No Further Action**

**SWMUs removed from Table B through a Class III Permit Modification and date of removal**

0-005	12-23-98	1-001(l)	12-23-98	8-003(c)	12-23-98	16-006(f)	12-23-98	SWMUs removed from Table B = <b>19</b>
1-001(h)	12-23-98	1-001(n)	12-23-98	8-007	12-23-98	21-012(a)	12-23-98	
1-001(i)	12-23-98	3-012(a)	12-23-98	15-012(a)		35-003(i)	12-23-98	
1-001(j)	12-23-98	3-020(a)	12-23-98	15-012(a)		36-003(c)	12-23-98	
1-001(k)	12-23-98	8-003(b)	12-23-98	16-005(o)	12-23-98			

**Table C**

RFI Work Plan due July 7, 1994: Technical Area 16	16-005(a)	16-025(x)	16-034(e)	16-026(z)	3-034(b)
	16-005(b)	16-025(y)	16-034(f)	16-028(b)	3-043(c)
	16-005(c)	16-025(z)	16-034(l)	16-028(c)	3-045(a)
	16-005(d)	16-026(m)	16-034(m)	16-028(d)	3-045(b)
	16-005(e)	16-026(n)	16-034(n)	16-028(e)	3-045(c)
	16-005(h)	16-026(o)	16-034(o)	16-029(h)	3-045(e)
	16-005(j)	16-026(p)	16-034(p)	16-029(i)	3-045(f)
	16-005(k)	16-026(q)	C-16-025	16-029(j)	3-045(g)
	16-005(l)	16-026(s)	C-16-026	16-030(a)	3-045(h)
	16-005(m)	16-026(w)	Total SWMUs = 92*	16-030(b)	3-045(i)
	16-006(g)	16-028(a)		16-030(c)	3-046
	16-006(h)	16-029(a2)	RFI Work Plan due July 7, 1995: Technical Area 16	16-030(e)	3-049(a)
	16-015(a)	16-029(b2)		16-030(f)	3-049(b)
	16-015(b)	16-029(c2)		16-031(a)	3-049(c)
	16-017	16-029(d2)	16-016(d)	16-031(b)	3-049(d)
	16-024(e)	16-029(e2)	16-016(e)	16-031(e)	3-049(e)
	16-025(a)	16-029(f2)	16-016(g)	16-031(f)	3-050(a)
	16-025(b)	16-029(g2)	16-025(a2)	16-031(h)	3-050(d)
	16-025(b2)	16-029(h2)	16-025(d2)	16-034(h)	3-050(e)
	16-025(c2)	16-029(k)	16-025(e2)	16-034(i)	3-050(f)
	16-025(d)	16-029(l)	16-025(f2)	16-034(j)	3-050(g)
	16-025(e)	16-029(m)	16-025(h2)	16-034(k)	3-052(a)
	16-025(f)	16-029(n)	16-026(a)	Total SWMUs = 51	3-052(c)
	16-025(g)	16-029(o)	16-026(a2)		3-052(e)
	16-025(h)	16-029(p)	16-026(b2)	RFI Work Plan due May 21, 1995: Operable Unit 1114	3-052(f)
	16-025(i)	16-029(q)	16-026(c2)		3-054(a)
	16-025(j)	16-029(r)	16-026(d2)		3-054(b)
	16-025(k)	16-029(s)	16-026(e2)	3-002(a)	3-054(c)
	16-025(l)	16-029(t)	16-026(f)	3-002(d)	3-054(d)
	16-025(m)	16-029(u)	16-026(f2)	3-009(c)	3-054(e)
	16-025(n)	16-029(v)	16-026(g)	3-009(i)	3-055(a)
	16-025(o)	16-029(w)	16-026(g2)	3-009(j)	3-055(c)
	16-025(p)	16-029(x)	16-026(h)	3-011	3-055(d)
	16-025(q)	16-029(y)	16-026(i)	3-019	3-056(d)
	16-025(r)	16-029(z)	16-026(j)	3-021	3-056(l)
	16-025(s)	16-031(c)	16-026(k)	3-025(a)	3-056(m)
	16-025(t)	16-031(d)	16-026(k2)	3-025(b)	3-056(n)
	16-025(u)	16-032(a)	16-026(l)	3-026(b)	3-059
	16-025(v)	16-032(c)	16-026(r)	3-026(c)	Total SWMUs = 54
	16-025(w)	16-034(a)	16-026(t)	3-029	
		16-034(b)	16-026(u)	3-031	* 20 additional SWMUs
		16-034(c)	16-026(x)	3-032	were added after work
		16-034(d)	16-026(y)	3-034(a)	plan review

**Table C.1****No Further Action****SWMUs removed from Table C through a Class III Permit Modification**

3-024	12-8-97	16-006(i)	12-23-98	16-026(i2)	12-23-98	16-032(e)	12-23-98	SWMUs removed from Table C = 11
3-045(d)	12-8-97	16-025(c)	12-23-98	16-031(g)	12-23-98	16-034(g)	12-23-98	
16-005(f)	12-23-98	16-025(g2)	12-23-98	16-032(d)	12-23-98			

## **Appendix D**

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*Attachments Common to More Than One SWMU*

## **Appendix E**

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*Documentation for Varying from  
HSWA Permit Modification Request Outline*